# BOSCH INJ. PUMP FEST SPECIFICATIONS

#### Note remarks

Test sheet : MB 11,0 a Edition : 07.02.89

Replaces

Test oil : ISO-4113

Combination no. : 0 402 775 801

Injection pump

Pump designation : PES5P120A720LS7172 EP type number : 0 412 725 805

Governor

Governor design. : RSV350...1050P0A529

-2

Governer no. : 0 421 833 312

Customer-spec. information

Customer : DAIMLER-BENZ

Engine : 0M449 LA

1st version kW : 221.0 : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 : (5.15...5.35) Prestroke mm

Rack travel in mm : 20.00...21.00

: 1-3-5-4-2 Firing order

Phasina : 0-72-144-216-288

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 5

BASIC SETTING

1st speed rpm: 1030

Rack travel in mm : 12.90...13.00

Del.quantity cm3/: 22.9...23.2

100 s: (22.6...23.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm: 4.5...4.8 Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.3)

cm3 : 0.8Spread

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 3.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1030 Speed Aneroid pressure h: 1500

: 229.0...232.0 Del.quantity 1000

: (226.0...235.0) : 5.00 Spread

cm3 1000 : (9.00)

RATED SPEED

1st version

Control Lever Aneroid pressure h: 750 position degrees: 50...58 rpm : 700 Speed Del.quantity cm3/: 235.0...238.0 1000 s: (232.0...241.0) Testina: 1st rack travel in: 11.90 cm3 : 8.00Spread rpm : 1090...1100 Speed 1000 s: (12.0) 2nd rack travel in: 4.00 Aneroid pressure h: 1500 : 1170...1200 : 750 Speed rpm Speed rom 4th rack travel in: 1300 Del.quantity cm3/: 251.0...254.0 Speed rom : 0.30...1.401000 s: (248.0...257.0) Spread cm3 : 8.00LOW IDLE 1 1000 s: (12.0) Control lever Aneroid pressure h: position degrees: 24...32 man Setting point w/out bumper spring Del.quantity cm3/: 146.0...148.0 : 350 rpm 1000 s: (143.0...151.0) Rack travel in mm: 4.65 Spread cm3 : 8.00Speed : 350 rom 1000 s: (12.0) Rack travel in mm : 4.50...4.80 SET IDLE AUXILIARY SPRING **BREAKAWAY** Rack travel in mm: 2.00 1st version TORQUE CONTROL 1mm rack travel less than Torque control curve - 1st version rom : 1030 1st speed full load rack tr: 11.90 Rack travel in m: 12.90...13.00 Speed rpm : 1090...1100 rpm : 750 2nd speed Rack travel in m: 13.90...14.00 STARTING FUEL DELIVERY rpm : 875 3rd speed Rack travel in m: 13.50...13.70 Speed rpm : 100 Aneroid/Altitude Del.quantity cm3/: 240.0...260.0 Compensator Test 1000 s: (236.0...264.0) Remarks: 1st version Setting : 600 Speed rom hPa : 750 Pressure Rack travel mm : 13.10...13.30 Measurement Speed 1/min: 600 . 2. \* 1st pressure hPa : 250 Rack travel in m: 10.50...10.70 2nd pressure hPa : 500 Rack travel in m: 12.20...12.40 3rd pressure hPa : 1050 Rack travel in m: 13.30...13.50 4th pressure hPa : 1500 Rack travel in m: 13.90...14.10 5th pressure hPa : -Rack travel in m: 9.50...9.90 FUEL DELIVERY CHARACTERISTICS 1st version

A02

### BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 12,0 c Edition : 07.02.89 Replaces : 9.9.88 Test oil : ISO-4113

Combination no. : 0 402 776 805

Injection pump

Pump designation : PES6P120A720LS7155 EP type number : 0 412 726 812

Governor

Governor design. : RSV350...1050P0A529

-1

Governer no. : 0 421 833 295

Customer-spec. information

Customer : DAIMLER BENZ

Engine : 0M447 LA

1st version kW : 265.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 019

**Opening** 

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 9.00...12.00

Firing order : 6-2-4-1-5-3

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 1050

Rack travel in mm : 13.40...13.50

Del.quantity cm3/: 24.0...24.2

100 s: (23.7...24.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 4.5...4.8

Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.3)

Spread cm3:0.8

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm: 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 3.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050 Aneroid pressure h: 1400

Del.quantity : 240.0...242.0

1000 : (237.0...245.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever 1st version position degrees: 50...58 Aneroid pressure h: 650 rpm : 600 Del.quantity cm3/: 234.0...237.0 1000 s: (231.0...240.0) Testina: 1st rack travel in: 12.40 rpm : 1090...1100 Spread cm3 : 8.002nd rack travel in: 4.00 1000 s: (12.0) Speed rpm : 1170...1200 4th rack travel in: 1300 Aneroid pressure h: 1400 Speed : 825 rpm Speed rpm : 0.30...1.40Del.quantity cm3/: 263.0...266.0 1000 s: (260.0...269.0) LOW IDLE 1 Spread cm3 : 8.00Control lever 1000 s: (12.0) position degrees: 24...32 Aneroid pressure h: -Speed rpm : 500
Del.quantity cm3/ : 151.0...154.0
1000 s: (148.0...157.0) Setting point w/out bumper spring rpm : 350 Speed Rack travel in mm: 4.65 Speed : 350 rpm Spread cm3 : 8.00 Rack travel in mm : 4.50...4.80 1000 s: (12.0) SET IDLE AUXILIARY SPRING Rack travel in mm: 2.00 **BREAKAWAY** TORQUE CONTROL 1st version Dimension a mm 1mm rack travel less than Torque control curve - 1st version st speed rpm : 1050 Rack travel in m: 13.40...13.50 1st speed full load rack tr: 12.40 Speed rpm : 1090...1100 rpm : 825 2nd speed Rack travel in m: 14.10...14.30 STARTING FUEL DELIVERY rpm : 950 3rd speed Rack travel in m: 13.60...13.80 Speed rpm : 100 Del.quantity cm3/ : 240.0...260.0 1000 s: (236.0...264.0) Aneroid/Altitude Compensator Test Remarks: 1st version Setting Speed : 600 rpm Pressure hPa : 650 Rack travel mm : 13.00...13.20 Measurement 1/min: 600 Speed 1st pressure hPa : 350 Rack travel in m: 10.70...10.90 2nd pressure hPa : 400 Rack travel in m: 11.40...11.60 3rd pressure hPa : 850 Rack travel in m: 13.20...13.40 4th pressure hPa : 1400 Rack travel in m: 14.30...14.50 5th pressure hPa : -Rack travel in m: 9.80...10.10 FUEL DELIVERY CHARACTERISTICS

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 D 9 : 10.02.89 Edition Replaces : 09.01.89 Test oil : ISO-4113

Combination no. : 0 403 436 108

Injection pump

Pump designation : PES6MW100/120RS1143

EP type number : 0 413 406 137

Governor

: RQV350...1100MW82-3 Governor design.

: 0 420 083 162 Governer no.

: 3914125 Cust. part no.

Customer-spec. information Customer : CUMMINS/US

Engine : 6 CTA-830

: 186.0 1st version kW : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 017 assembly

**Openina** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00x2.00x600 x Lenath mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.05...3.15

: (3.00...3.20)
Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Phasing

Tolerance + - º : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 12.40...12.50

Del.quantity cm3/: 14.8...15.0

100 s: (14.6...15.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0 Rack travel in mm : 7.2...7.4

Del.quantity cm3/: 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1240 1st speed

: 8.80...9.20 travel mm

2nd speed : 1140 rpm

travel mm : 7.80...8.00

3rd speed : 700 rpm

: 3.80...4.40 : 350 : 1.20...1.60 travel mm

4th speed rpm

travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

: 148.0...150.0 Del.quantity

1000 : (146.0...152.0) cm3 : 3.50

Spread

1000 : (6.00)

RATED SPEED

1st version Control Lever Testing:

position degrees: 44...52

1st rack travel in: 11.40

Speed rpm : 1150...1160

2nd rack travel in: 4.00

Speed rpm : 1235...1265 4th rack travel in: 1350 Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 13...21

Setting point w/out bumper spring

rpm Rack travel in mm: 7.3

Testing:

Speed rpm : 100 Minimum rack trave: 9.30 Speed rpm : 350 Rack travel in mm : 7.20...7.40

CONSTANT REGULATION

rpm : 360...500 Speed

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1100
Rack travel in m: 12.40...12.50
2nd speed rpm : 700

Rack travel in m: 13.20...13.30

3rd speed rpm : 1050

Rack travel in m: 12.40...12.60

4th speed rpm : 900

Rack travel in m: 12.80...13.00

Aneroid/Altitude Compensator Test

1st version Setting

Speed rpm : 500

Pressure hPa : -Rack travel mm : 10.20...10.30

Measurement

1/min: 500 Speed

1st pressure hPa : 300

Rack travel in m: 11.30...11.40

2nd pressure hPa : 520

Rack travel in m: 12.70...13.00

3rd pressure hPa : 900

Rack travel in m: 13.20...13.30

START CUT-OUT

1/min: 270 (280) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 700 Del.quantity cm3/ : 159.0...161.0 1000 s: (157.0...163.0)

Spread cm3 : 5.001000 s: (7.0)

Aneroid pressure h: rpm : 500 Speed

Del.quantity cm3/: 103.0...106.0 1000 s: (101.5...107.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.40

Speed rpm : 1150...1160

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 205.0...225.0

1000 s: (202.0...228.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350 Rack travel in mm : 7.20...7.40 Del.quantity cm3/: 16.0...20.0

1000 s: (13.5...22.5)

cm3 : 3.50Spread

1000 s: (5.50)

Remarks:

Start-of-delivery mark 9° cam angle after start of delivery cyl. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : CUM 8,3 D 7 : 10.02.89 Test sheet Edition Replaces : 11.11.88 Test oil : ISO-4113 Combination no. : 0 403 436 109 Injection pump Pump designation : PES6MW100/120RS1143 EP type number : 0 413 406 137 Governor Governor design. : RQV300...1050MW82-4 : 0 420 083 168 Governer no. Cust. part no. : 3915581 Customer-spec. information Customer : CUMMINS/US Engine : 6 CTA-830 1st version kW : 175.0 Rated speed : 2100 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 047 Inlet press., bar: 1.50 Test nozzle holder assembly : 1 688 901 017 Opening : 207...210 pressure, bar Orifice plate diameter mm : 0,6 Test lines : 1 680 750 008

(B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 1210 travel mm : 9.00...9.40 rpm : 1100 2nd speed travel mm : 7.90...8.10 : 550 3rd speed rom travel mm 3.00...3.60 300 4th speed rpm 1.10...1.50 travel mm FULL LOAD DELIV. AT FULL LOAD STOP Outside diameter x Wall thickness 1st version : 6.00X2.00X600 x Length mm Speed rpm : 1050 Aneroid pressure h: 900 (A) Injection pump setting values Del.quantity : 148.0...150.0 1000 : (146.0...152.0) cm3 : 3.50 Insp. values in parentheses Set equal delivery quant. Spread : (6.00) per values 1000 BEGINNING OF DELIVERY RATED SPEED

Test pressure, bar: 30...32

: (3.00...3.20) Rack travel in mm : 9.00...12.00

rom: 1050

100 s: (14.6...15.2)

100 s: (1.3...2.2)

Rack travel in mm : 12.60...12.70

cm3 : 0.3

cm3 : 0.3

100 s: (0.5)

100 s: (0.6)

Del.quantity cm3/: 14.8...15.0

2nd speed rpm : 300.0 Rack travel in mm : 7.7...7.9

Del.quantity cm3/: 1.6...2.0

Prestroke mm

Firing order

Tolerance + - 0

BASIC SETTING

1st speed

Spread

Spread

Time to cyl. no. : 1

Phasing

Phasing

: 3.05...3.15

: 0.50 (0.75)

: 1-5- 3- 6- 2- 4

: 0-60-120-180-240-300

1st version Control Lever position degrees: 42...50 Testing: 1st rack travel in: 11.60 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 rpm : 1185...1215 Speed 4th rack travel in: 1300 Speed rom : 0.00...1.00 LOW IDLE 1 Control Lever position degrees: 10...18 Setting point w/out bumper spring rom Rack travel in mm: 7.8 Testing: Speed rpm : 100 Minimum rack trave: 9.30 Speed rpm : 300 Rack travel in mm : 7.70...7.90 Aneroid/Altitude Compensator Test 1st version Setting rpm : 500 Speed Pressure hPa : -Rack travel mm : 9.50...9.70 Measurement 1/min: 500 Speed 1st pressure hPa : 300 Rack travel in m: 10.80...10.90 2nd pressure hPa : 520 Rack travel in m: 11.90...12.20 3rd pressure hPa : 900 Rack travel in m: 12.60...12.70 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 900 Speed rpm : 700 Del.quantity cm3/ : 145.5...148.5 1000 s: (143.0...151.0) cm3 : 5.00 Spread 1000 s: (7.0)

Aneroid pressure h: -Speed rpm: 500 Del.quantity cm3/: 78.0...80.0 1000 s: (76.0...82.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.60 rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

rpm : 100 Del.quantity cm3/: 215.0...225.0 1000 s: (212.0...228.0) Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 300 Rack travel in mm : 7.70...7.90 Del.quantity cm3/: 16.0...20.0 1000 s: (13.5...22.5) Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

Start-of-delivery mark/lock = 8.0° angular displacement of the cam after start of delivery of cylinder 1.

**80A** 

# BOSCH INJ. PUMP TEST SPECIFICATIONS

# Note remarks

Test sheet : VOL 6,1 F Edition : 24.02.89 : 4.86 Replaces : ISO-4113 Test oil

Combination no. : 0 403 446 151

Injection pure

Pump designation : PES6MW100/320RS1119 : 0 413 406 113

EP type number Governor

Governor design. : RQV300..1400MW58 : 0 420 083 080 Governer no.

Customer-spec. information Customer : VOLVO

: TD 61..3012 Engine

1st version kW : 113.0 Rated speed : 2800

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening 1

: 172...175 pressure, bar

Test Lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.10...3.20 : (3.05...3.25) Prestroke mm Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

# BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 10.10...10.20

Del.quantity cm3/: 7.5...7.7

100 s: (7.3...7.9)

Spread cm3 : 0.35

100 s: (0.6)

2nd speed rpm : 300.0 Rack travel in mm: 6.5...6.6 Del.quantity cm3/: 1.6...2.0 100 s: (1.3...2.2)

cm3 : 0.35 Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2 rpm : 1480

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 75.0...77.0 1000 : (73.0...79.0)

: 3.50 Spread cm3

: (6.00) 1000

# RATED SPEED

1st version

Control lever

position degrees: 56...64

Testing:

1st rack travel in: 9.00

Speed rpm : 1440...1450

2nd rack travel in: 4.00

Speed rpm : 1565...1595 4th rack travel in: 1680

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

A09

position degrees: 9...17

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm : 6.5...6.6

Testing:

Speed : 100 rpm Minimum rack trave: 8.10 rpm : 300 Speed

Rack travel in mm : 6.50...6.60

RACK STOP ADJUSTMENT

Speed rpm : 100

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 9.00

Speed rpm : 1440...1450

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 140.0...160.0 1000 s: (137.0...163.0) Rack travel in mm: 19.00...21.00

LOW IDLE

Speed : 300 rpm

Rack travel in mm : 6.50...6.60 Del.quantity cm3/: 16.0...20.0 1000 s: (13.5...22.5) Spread cm3 : 3.50 1000 s: (5.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

#### Note remarks

Test sheet : VOL 6,1 H Edition : 03.03.89 Replaces : 29.04.88 Test oil : ISO-4113

Combination no. : 0 403 446 152

Injection pump

Pump designation : PES6MW100/320RS1119

EP type number : 0 413 406 113

Governor

Governor design. : RQV300...1400MW57

: 0 420 083 078 Governer no.

Customer-spec. information Customer : VOLVO

Engine : TD 61-3012

1st version kW : 132.0 Rated speed : 2800

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.10...3.20

: (3.05...3.25) Rack travel in im: 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

#### BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 11.40...11.50

Del.guantity cm3/: 9.0...9.2

100 s: (8.8...9.4)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 300.02nd speed Rack travel in mm : 6.9...7.0 Del.quantity cm3/: 1.6...2.D

100 s: (1.3...2.2) cm3 : 0.3 Spread

100 s: (0.5)

# (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

rpm : 1580 1st speed

: 9.50...9.90 travel mm rpm : 1450 2nd speed

: 8.40...8.60 travel mm

3rd speed : 550 rpm

: 3.40...4.00 : 300 travel mm

4th speed rpm

: 1.20...1.60 travel mm

# GUIDE SLEEVE POSITION

Control-lever position Degree: -2

rpm : 1480

Rack travel in mm : 15.20...17.80

# FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

Aneroid pressure h: 505

: 90.0...92.0 Del.quantity

1000 : (88.0...94.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control Lever position degrees: 58...66 Testing: 1st rack travel in: 10.60 Speed rpm : 1440...1450 2nd rack travel in: 4.00

LOW IDLE 1 Control lever position degrees: 12...20 Setting point w/out bumper spring

Speed rpm : 1595...1625 4th rack travel in: 1725

rpm : 0.10...1.00

Speed rpm : 300 Rack travel in mm : 6.9

Speed

Testing: Speed rpm : 100 Minimum rack trave: 8.50 rpm : 300 Rack travel in mm : 6.90...7.00

Aneroid/Altitude Compensator Test

1st version Setting : 550 Speed rpm hPa : 445 Pressure

Rack travel mm : 11.20...11.30

Measurement 1/min: 550 Speed

1st pressure hPa : -Rack travel in m: 10.10...10.20 2nd pressure hPa : 310 Rack travel in m: 10.30...10.50 3rd pressure hPa : 505 Rack travel in m: 11.40...11.50

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: -Speed rpm : 1000 Del.quantity cm3/: 75.0...77.0 1000 s: (73.0...79.0)

RACK STOP ADJUSTMENT

: 100 Speed rpm

BREAKAWAY

A12

1st version 1mm rack travel less than

full load rack tr: 10.60 Speed rpm : 1440...1450

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 140.0...160.0 1000 s: (137.0...163.0)

LOW IDLE

Speed rpm : 300 Rack travel in mm : 6.90...7.00 Del.quantity cm3/: 16.0...20.0 1000 s: (13.5...22.5) Spread cm3: 3.50 1000 s: (5.00)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : VOL 6,1 G Edition : 03.03.89 Replaces : 29.04.88 Test oil : ISO-4113 Combination no. : 0 403 446 153 Injection pump Pump designation : PES6MW100/320RS1119-: 0 413 406 114 EP type number Governor Governor design. : RQV300..1400MW57-1 Governer no. : 0 420 083 079 Customer-spec. information Customer : VOLVO Engine : TD 61..3012 1st version kW : 150.0 Rated speed : 2800 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow walve : 1 417 413 000 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 009 assembly Openina pressure, bar : 172...175 Test lines : 1 680 750 014 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

: 3.10...3.20 : (3.05...3.25)

per values

BEGINNING OF DELIVERY

Prestroke mm

Test pressure, bar: 30...32

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Rack travel in mm : 9.00...12.00
Firing order : 1-5-3-6-2-4
Phasina
                    : 0-60-120-180-240-300
Tolerance + - °
                   : 0.50 (0.75)
BASIC SETTING
1st speed
               rpm: 1000
Rack travel in mm : 12.00...12.10
Del.quantity cm3/: 10.4...10.6
              100 s: (10.3...10.9)
              cm3 : 0.3
Spread
              100 s: (0.6)
              rpm : 300.0
2nd speed
Rack travel in mm: 6.3...6.4
Del.quantity cm3/ : 1.6...2.0
              100 s: (1.3...2.2)
              cm3 : 0.3
Spread
              100 s: (0.5)
(B) Setting of injection pump
    with governor
GUIDE SLEEVE TRAVEL
             rpm : 1580
1st speed
                   : 9.50...9.90
  travel mm
2nd speed
             rpm : 1450
                   : 8.40...8.60
  travel mm
                  : 550
: 3.40...4.00
: 300
: 1.20...1.60
3rd speed
             rom
  travel mm
4th speed
             rpm
  travel mm
GUIDE SLEEVE POSITION
Control-lever position
            Degree: -2
             rpm : 1480
Speed
Rack travel in mm : 15.20...17.80
FULL LOAD DELIV. AT FULL LOAD STOP
1st version
Speed
             rpm : 1000
Aneroid pressure h: 615
                  : 104.0...106.0
Del.quantity
            1000 : (103.0...109.0)
cm3 : 3.50
Spread
                 : (6.00)
            1000
```

RATED SPEED

1st version Control lever

position degrees: 57...65

Testing:

1st rack travel in: 11.00

rpm : 1440...1450 Speed

2nd rack travel in: 4.00

Speed rpm : 1590...1620 4th rack travel in: 1700

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 9...17

Setting point w/out bumper spring

rpm : 300 Rack travel in mm: 6.3

Testing:

Speed rpm : 100 Minimum rack trave: 7.90 Speed rpm : 300

Rack travel in mm : 6.30...6.40

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 550 hPa : 525 Pressure

: 11.80...11.90 Rack travel mm

Measurement

Speed 1/min: 550

1st pressure hPa : -

Rack travel in m: 10.10...10.20

2nd pressure hPa : 270

Rack travel in m: 10.30...10.50

3rd pressure hPa : 615

Rack travel in m: 12.00...12.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

rpm : 1000 Speed

Del.quantity cm3/: 75.0...77.0 1000 s: (73.0...79.0)

RACK STOP ADJUSTMENT

rpm : 100 Speed

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.00

Speed rpm : 1440...1450

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 140.0...160.0

1000 s: (137.0...163.0) Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 300 Rack travel in mm : 6.30...6.40 Del.quantity cm3/: 16.0...20.0 1000 s: (13.5...22.5)

Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

A14

# BOSCH INJ. PUMP TEST SPECIFICATIONS

# Note remarks

Test sheet Edition : RVI 8,8 Q : 07.02.89 Replaces : 30.09.88 Test oil : ISO-4113

Combination no. : 0 403 446 190

Injection pump

Pump designation : PES6MW100/320RS1154 : 0 413 406 144

EP type number

Governor

Governor design. : RQV275...1250MW80

: 0 420 083 128 Governer no.

Customer-spec, information Customer : RVI

Engine : MIDR 060226

1st version kW : 128.7 : 2500 Rated speed

# TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 033

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

**Opening** 

pressure, bar : 172...175

Test Lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.50...3.60 : (3.45...3.65) Prestroke mm Rack travel in mm: 16.50...19.50

A15

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1250

Rack travel in mm : 12.90...13.00

Del.quantity cm3/: 9.9...10.1

100 s: (9.7...10.3)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 275.0

Rack travel in mm : 6.10...6.30 Del.quantity cm3/: 2.3...2.7

100 s: (2.0...2.9)

Spread cm3 : 0.3100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1475 1st speed

travel mm : 9.20...9.60

rpm : 1300 2nd speed

: 7.80...8.00 travel mm

3rd speed rpm

: 500 : 3.00...3.60 : 275 travel mm

4th speed rpm

: 1.00...1.40 travel mm

GUIDE SLEEVE POSITION Control-lever position Degree: -1

rpm : 1300

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1250 Speed Aneroid pressure h: 800

99.5...101.5 1000 : (97.5...103.5) Del.quantity

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control Lever position degrees: 48...56 Testina: 1st rack travel in: 12.00 rpm : 1330...1350 Speed 2nd rack travel in: 4.00 Speed rpm: 1490...1530 4th rack travel in: 1600 Speed rpm : 0.00...1.00 LOW IDLE 1 Control lever position degrees: 12...20 Setting point w/out bumper spring Speed rpm : 275 Rack travel in mm : 6.8 Testina: Speed rpm: 200 Minimum rack trave: 7.70 Speed rpm : 275 Rack travel in mm : 6.10...6.30 Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 500 Pressure hPa : 800 Rack travel mm : 12.90...13.00 Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 11.10...11.00 2nd pressure hPa : 200 Rack travel in m: 11.80...11.50 3rd pressure hPa : 360 Rack travel in m: 12.60...12.70 START CUT-OUT 1/min: 200 (220) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 800 rpm : 750 Speed Del.quantity cm3/: 91.5...94.5 1000 s: (89.0...97.0) Spread cm3 : 5.00

1000 s: (7.0)

Aneroid pressure h: -

rpm : 500 Speed Del.quantity cm3/: 49.0...51.0 1000 s: (47.0...53.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.00 rpm : 1330...1350 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 88.0...102.0 1000 s: (85.0...105.0) Rack travel in mm : 19.50...21.00 LOW IDLE rpm : 275 Speed Rack travel in mm : 6.30...6.10 Del.quantity cm3/: 23.0...27.0 1000 s: (20.5...29.5) Spread cm3 : 3.50 1000 s: (5.00) Remarks: Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : IHC 7,6 S : 09.12.88 Test sheet Edition Replaces : 06.04.88 Test oil : ISO-4113 : 0 403 446 193 Combination no. Injection pump Pump designation: PES6MW100/320RS1159 EP type number : 0 413 406 146 Governor Governor design. : RQV350...1300MW72-3 : 0 420 083 142 Governer no. Customer-spec, information Customer : NAVISTAR Engine : DT-466 1st version kW : 136.0 Rated speed : 2600 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 2 417 413 037 Inlet press., bar: 2.80 Test nozzle holder assembly : 1 688 901 016

Opening pressure, bar	: 207210
Orifice plate diameter mm	: 0,5
Test lines	: 1 680 750 008
Outside diameter x Wall thickness x Length mm	: 6.00x2.00x600
(4)	

(A)	Injection pump setting values
	Insp. values in parentheses Set equal delivery quant.
	per values

BEGINNING OF DELIVERY Test pressure, bar: 30...32

Prestroke mm : 4.00...4.10 : (3.95...4.15) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance + - 0 : 0.50 (0.75) BASIC SETTING 1st speed rpm: 900 Rack travel in mm : 10.60...10.70 Del.quantity cm3/: 9.0...9.2 100 s: (8.8...9.4) Spread cm3 : 0.3100 s: (0.6) 2nd speed rpm : 350.0Rack travel in mm: 6.4...6.5 Del.quantity cm3/: 1.6...2.0 100 s: (1.3...2.2) cm3 : 0.3 100 s: (0.5) Spread (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 1250 travel mm : 7.80...8.00 rpm : 1340 2nd speed : 8.80...9.20 travel mm rpm : 500 : 2.60...3.20 rpm : 350 3rd speed travel mm 4th speed : 1.30...1.80 travel mm FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 900

Del.quantity : 90.0...92.0 1000 : (88.0...94.0) cm3 : 3.50 Spread

1000 : (6.00)

RATED SPEED

1st version Control lever position degrees: 46...51 Testing:

1st rack travel in: 9.60

rpm : 1370...1390 Speed

2nd rack travel in: 4.00

Speed rpm : 1475...1485

4th rack travel in: 1550

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 11...19

Setting point w/out bumper spring

rpm : 350 Rack travel in mm: 6.4

Testina:

rpm : 100 Speed

Minimum rack trave: 9.00

Speed rpm : 350 Rack travel in mm : 6.40...6.50

CONSTANT REGULATION

rpm : 370...500 Speed

START CUT-OUT

1/min: 180 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1300 Del.quantity cm3/: 94.0...98.0

1000 s: (92.0...100.0)

cm3 : 6.50Spread

1000 s: (7.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 9.60

rpm : 1370...1390 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 140.0...180.0

1000 s: (137.0...183.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

rpm : 350

Rack travel in mm : 6.40...6.50

Del.quantity cm3/: 16.0...20.0 1000 s: (13.5...22.5)

cm3 : 3.50 Spread

1000 s: (5.50)

Remarks:

Perform pump setting only with IH hose with restriction of 1.2 mm diameter.

Before checking sleeve position, first adjust latching.

In unlatched condition, do not operate greater than n = 500 1/min

Set low idle at stop screw.

Set shutoff stop 1.5...2.0 mm before shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : IHC 7,6 R20 : 09.12.88 : 05.08.88 Test sheet Edition Replaces Test oil : ISO-4113 Combination no. : 0 403 446 194 Injection pump Pump designation : PES6MW100/320RS1112 EP type number : 0 413 406 108 Governor Governor design. : RQV350...1300MW46-12 Governer no. : 0 420 083 143 Customer-spec, information Customer : NAVISTAR Engine : DT-466 : 154.5 1st version kW : 2600 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 2 417 413 037 Inlet press., bar: 2.80 Test nozzle holder : 1 688 901 016 assembly **Opening** pressure, bar : 207...210 Orifice plate diameter mm : 0,5 Test lines : 1 680 750 008 Outside diameter x Wall thickness : 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 30...32

Prestroke mm : 4.00...4.10 : (3.95...4.15) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance + - 0 : 0.50 (0.75) BASIC SETTING rpm: 900 1st speed Rack travel in mm : 10.80...10.90 Del.quantity cm3/: 10.3...10.5 100 s: (10.1...10.7) Spread cm3 : 0.3100 s: (0.6) 2nd speed rpm : 350.0 Rack travel in mm : 5.5...5.6 Del.quantity cm3/ : 1.6...2.0 100 s: (1.3...2.2) cm3 : 0.3Spread 100 s: (0.5) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 1350 travel mm : 8.30...8.50 2nd speed rpm : 1460 travel mm : 9.10...9.50 rpm : 550 3rd speed : 3.10...3.70 travel mm : 350 : 1.30...1.70 4th speed rpm travel mm FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 900 Speed Aneroid pressure h: 800 Del.quantity : 103.0...105.0 1000 : (101.0...107.0) cm3 : 3.50 Spread 1000 : (6.00) RATED SPEED 1st version Control lever position degrees: 44...49

Testing: 1st rack travel in: 9.80 Speed rpm : 1365...1385 2nd rack travel in: 4.00 rpm : 1470...1480 Speed 4th rack travel in: 1550 Speed rpm : 0.00...1.00 LOW IDLE 1 Control lever position degrees: 9...17 Setting point w/out bumper spring Speed rpm : 350 Rack travel in mm : 5.5 Testing: : 100 Speed rom Minimum rack trave: 7.30 rpm : 350Rack travel in mm : 5.50...5.60 CONSTANT REGULATION rpm : 360...450 Speed Aneroid/Altitude Compensator Test 1st version Setting rpm : 500 hPa : 170 Speed man Pressure Rack travel mm : 10.40...10.50 Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 10.10...10.20 2nd pressure hPa : 230 Rack travel in m: 10.60...10.90 3rd pressure hPa : 800 Rack travel in m: 10.80...10.90 START CUT-OUT 1/min: 180 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 800

rpm\_ : 1300

Aneroid pressure h: -

Del.quantity cm3/: 105.0...109.0 1000 s: (103.0...111.0) Spread cm3 : 5.00 1000 s: (7.9)

Speed rpm : 500
Del.quantity cm3/ : 87.0...89.0
 1000 s: (85.0...91.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.80 rpm : 1365...1385 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 140.0...180.0 1000 s: (137.0...183.0) Rack travel in mm : 19.00...21.00 LOW IDLE Speed rpm : 350 Rack travel in mm : 5.50...5.60 Del.quantity cm3/: 16.0...20.0 1000 s: (13.5...22.5) cm3 : 3.50 1000 s: (5.50) Spread Remarks: Perform pump setting only with IH hose with restriction of 1.2 mm diameter. Before checking sleeve position, first adjust latching. In unlatched condition, do not operate greater than n = 500 1/minSet low idle at stop screw. Set shutoff stop 1.5...2.0 mm before shutoff.

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#### Prestroke mm : 4.00...4.10 : (3.95...4.15) Rack travel in mm : 9.00...12.00 BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Firing order : 1-5-3-6-2-4 : IHC 7,6 R21 Test sheet Edition : 09.12.88 : 19.02.88 Replaces Test oil : ISO-4113 : 0-60-120-180-240-300 Phasing Combination no. : 0 403 446 195 Tolerance + - ° : 0.50 (0.75) Injection pump BASIC SETTING Pump designation : PES6MW100/320RS1112 EP type number : 0 413 406 108 1st speed rpm: 800 Governor Governor design. : RQV350...1200MW46-13 Rack travel in mm: 12.30...12.40 Governer no. : 0 420 083 144 Del.quantity cm3/: 11.7...11.9 Customer-spec. information Customer : NAVISTAR 100 s: (11.5...12.1) Engine : DTA-466 Spread cm3 : 0.31st version kW : 180.0 100 s: (0.6) : 2400 Rated speed rpm : 350.0 2nd speed TEST BENCH REQUIREMENTS Rack travel in mm: 6.3...6.4 Del.quantity cm3/: 1.9...2.3 Test oil 100 s: (1.6...2.5) cm3 : 0.3 inlet temp. °C : 38...42 Spread 100 s: (0.5) Overflow valve : 2 417 413 037 (B) Setting of injection pump with governor Inlet press., bar: 2.80 GUIDE SLEEVE TRAVEL Test nozzle holder 1st speed rpm : 1350 : 1 688 901 016 assembly travel mm : 8.30...8.50 rpm : 1460 2nd speed **Opening** : 9.10...9.50 travel mm pressure, bar : 207...210 rpm : 550 3rd speed : 3.10...3.70 travel mm Orifice plate rom : 350 4th speed diameter mm : 0,5 : 1.30...1.70 travel mm FULL LOAD DELIV. AT FULL LOAD STOP : 1 680 750 008 1st version

Test Lines

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 30...32 RATED SPEED

Speed

Spread

1st version Control lever

position degrees: 43...48

cm3

Aneroid pressure h: 800

rpm : 800

Del.quantity : 117.5...119.5 1000 : (115.5...121.5)

: 3.50

1000 : (6.00)

Testina: 1st rack travel in: 11.30 rpm : 1265...1285 Speed 2nd rack travel in: 4.00 : 1395...1405 Speed rpm 4th rack travel in: 1500 Speed rpm : 0.00...1.00 LOW IDLE 1 Control lever position degrees: 12...20 Setting point w/out bumper spring

Speed rpm : 350 Rack travel in mm : 6.3

Testing: Speed rpm : 100 Minimum rack trave: 9.00 rpm : 350 Speed

Rack travel in mm : 6.30...6.40

CONSTANT REGULATION Speed rom : 360...450

Aneroid/Altitude Compensator Test

1st version Setting Speed rpm

rpm : 500 hPa : 190 Pressure : 11.20...11.30 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -Rack travel in m: 10.60...10.70 2nd pressure hPa : 360 Rack travel in m: 11.90...12.20

3rd pressure hPa : 800

Rack travel in m: 12.30...12.40

START CUT-OUT

1/min: 180 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 800 rpm : 1200

Del.quantity cm3/: 120.0...124.0 1000 s: (118.0...126.0)

cm3 : 5.00 Spread 1000 s: (7.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 86.0...88.0 1000 s: (84.0...90.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.30

rpm : 1265...1285 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 140.0...180.0 1000 s: (137.0...183.0) Rack travel in mm: 19.00...21.00

LOW IDLE

Speed rpm : 350 Rack travel in mm : 6.30...6.40

Del.quantity cm3/: 19.0...23.0 1000 s: (16.5...25.5) Spread cm3: 3.50 1000 s: (5.50)

Remarks:

Perform pump setting only with IH hose with restriction of 1.2 mm diameter.

Before checking sleeve position, first adjust latching.

In unlatched condition, do not operate greater than n = 500 1/min

Set low idle at stop screw.

Set shutoff stop 1.5...2.0 mm before shutoff.

Prestroke mm : 4.00...4.10 : (3.95...4.15) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : IHC 7,6 R23 : 09.12.88 : 19.02.88 Test sheet Edition Replaces : ISO-4113 Test oil Phasing : 0-60-120-180-240-300 Combination no. : 0 403 446 196 Tolerance  $+ - \circ : 0.50 (0.75)$ Injection pump BASIC SETTING Pump designation : PES6MW100/320RS1112 EP type number : 0 413 406 108 1st speed rpm: 800 Governor Governor design. : RQV350...1200MW46-14 Rack travel in mm : 11.40...11.50 : 0 420 083 145 Governer no. Del.quantity cm3/: 10.4...10.6 Customer-spec, information Customer : NAVISTAR 100 s: (10.2...10.8) Engine : DTA-466 Spread cm3 : 0.31st version kW : 169.0 100 s: (0.6) Rated speed : 2400 rpm : 350.0 2nd speed TEST BENCH REQUIREMENTS Rack travel in mm: 6.2...6.3 Del.quantity cm3/: 1.6...2.0 100 s: (1.3...2.2) cm3 : 0.3 Test oil inlet temp. °C : 38...42 Spread 100 s: (0.5) Overflow valve : 2 417 413 037 (B) Setting of injection pump with governor Inlet press., bar: 2.80 GUIDE SLEEVE TRAVEL Test nozzle holder rpm : 1350 1st speed assembly : 1 688 901 016 : 8.30...8.50 travel mm rpm : 1460 2nd speed **Opening** : 9.10...9.50 travel mm : 207...210 pressure, bar rpm : 550 3rd speed : 3.10...3.70 rpm : 350 travel mm Orifice plate 4th speed diameter mm : 0,5 : 1.30...1.70 travel mm FULL LOAD DELIV. AT FULL LOAD STOP Test Lines : 1 680 750 008 1st version Outside diameter Speed rpm : 800 x Wall thickness Aneroid pressure h: 800 x Length mm : 6.00X2.00X600 Del.quantity : 104.0...106.0 1000 : (102.0...108.0) (A) Injection pump setting values Spread cm3 : 3.50 Insp. values in parentheses 1000 : (6.00) Set equal delivery quant. per values RATED SPEED

1st version

Control lever

position degrees: 44...49

A23

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Testina: 1st rack travel in: 10.40 rpm : 1250...1270 Speed 2nd rack travel in: 4.00 rpm : 1390...1400 Speed 4th rack travel in: 1460 Speed rpm : 0.09...1.00LOW IDLE 1 Control lever position degrees: 12...20 Setting point w/out bumper spring : 350 rpm Rack travel in mm: 6.2 Testing: rpm : 100 Speed Minimum rack trave: 9.00 : 350 Speed rpm Rack travel in mm : 6.20...6.30 CONSTANT REGULATION Speed : 360...450 rcm Aneroid/Altitude Compensator Test 1st version Settina : 500 Speed rpm hPa : 180 Pressure : 10.80...10.90 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 10.50...10.60 2nd pressure hPa : 270 Rack travel in m: 11.10...11.20 3rd pressure hPa : 800 Rack travel in m: 11.40...11.50 START CUT-OUT 1/min: 180 (240) Speed FUEL DELIVERY CHARACTERISTICS

Speed : 500 rpm Del.quantity cm3/: 84.0...86.0 1000 s: (82.0...88.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.40 Speed rpm : 1250...1270 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 140.0...180.0 1000 s: (137.0...183.0) Rack travel in mm: 19.00...21.00 LOW IDLE Speed rpm : 350 Rack travel in mm : 6.20...6.30 Del.quantity cm3/: 16.0...20.0 1000 s: (13.5...22.5) Spread cm3 : 3.50 1000 s: (5.50) Remarks:

Perform pump setting only with IH hose with restriction of 1.2 mm diameter.

Before checking sleeve position, first adjust latching.

In unlatched condition, do not operate greater than n = 500 1/min

Set low idle at stop screw.

Set shutoff stop 1.5...2.0 mm before shutoff.

1st version

Speed

Spread

Aneroid pressure h: 800

Aneroid pressure h: -

rpm : 1200 Del.quantity cm3/: 107.0...111.0 1000 s: (105.0...113.0) cm3 : 6.50

1000 s: (7.0)

#### BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 4.00...4.10 : (3.95...4.15) Rack travel in mm : 9.00...12.00 Note remarks Firing order : 1-5-3-6-2-4 : IHC 7,6 R24 : 09.12.88 Test sheet Edition : 22.04.88 Replaces Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 403 446 197 Tolerance + - 0 : 0.50 (0.75) Injection pump BASIC SETTING Pump designation : PES6MW100/320RS1112 EP type number : 0 413 406 108 1st speed rpm: 800 Governor Governor design. : RQV350...1200MW46-15 Rack travel in mm : 11.00...11.10 : 0 420 083 146 Governer no. Del.quantity cm3/: 9.9...10.1 Customer-spec. information Customer : NAVISTAR 100 s: (9.7...10.3) Engine : DTA-466 Spread cm3 : 0.31st version kW : 158.0 100 s: (0.6) Rated speed : 2400 2nd speed rpm : 350.0Rack travel in mm : 6.3...6.4 Del.quantity cm3/ : 1.9...2.3 TEST BENCH REQUIREMENTS Test oil 100 s: (1.6...2.5) inlet temp. °C : 38...42 Spread cm3 : 0.3100 s: (0.5) Overflow valve : 2 417 413 037 (B) Setting of injection pump with governor Inlet press., bar: 2.80 GUIDE SLEEVE TRAVEL Test nozzle holder 1st speed rpm : 1350 : 1 688 901 016 assembly travel mm : 8.30...8.50 : 1460 2nd speed rpm Opening | travel mm : 9.10...9.50 : 207...210 pressure, bar 3rd speed rpm : 550 : 3.10...3.70 travel mm Orifice plate 4th speed : 350 rpm diameter mm : 0,5 : 1.30...1.70 travel mm FULL LOAD DELIV. AT FULL LOAD STOP Test lines : 1 680 750 008 1st version Speed rpm : 800 x Wall thickness Aneroid pressure h: 800 : 6.00x2,00x600 Del.quantity : 99.0...101.0 1000 : (97.0...103.0)

Outside diameter

x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 30...32 RATED SPEED 1st version

Spread

Control lever position degrees: 43...48

cm3

1000

: 3.50

: (6.00)

Testina: 1st rack travel in: 10.00 : 1270...1290 rom 2nd rack travel in: 4.00 speed rpm : 1380...1390 4th rack travel in: 1500 Speed LOW IDLE 1 Control Lever position degrees: 10...18 Setting point w/out bumper spring rom Rack travel in mm: 6.3 Testing: Speed rpm : 100 Minimum rack trave: 9.00 Speed rpm Rack travel in mm : 6.30...6.40 CONSTANT REGULATION : 360...450 Speed rom Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm hPa : 200 Pressure Rack travel mm : 10.70...10.80 Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 10.40...10.50 2nd pressure hPa : 280 Rack travel in m: 10.80...11.10 3rd pressure hPa : 800 Rack travel in m: 11.00...11.10 START CUT-OUT Speed 1/min: 180 (240) FUEL DELIVERY CHARACTERISTICS 1st version

Speed Del.quantity cm3/: 84.0...86.0 1000 s: (82.0...88.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.00 Speed STARTING FUEL DELIVERY LOW IDLE Speed Remarks:

Speed rpm : 100 Del.quantity cm3/ : 140.0...180.0 1000 s: (137.0...183.0) Rack travel in mm : 19.00...21.00 rpm : 350Rack travel in mm : 6.30...6.40 Del.quantity cm3/: 19.0...23.0 1000 s: (16.5...25.5) Spread cm3 : 3.50 1000 s: (5.50) Perform pump setting only with IH hose with restriction of 1.2 mm diameter. Before checking sleeve position, first adjust latching. In unlatched condition, do not operate greater than n = 500 1/minSet low idle at stop screw. Set shutoff stop 1.5...2.0 mm before shutoff.

rpm

rpm : 1270...1290

Speed

Spread

Aneroid pressure h: 800

Aneroid pressure h: -

rom Del.quantity cm3/: 101.0...105.0

: 1200

cm3 : 5.00

1000 s: (7.0)

1000 s: (99.0...107.0)

# BOSCH INJ. PUMP TEST SPECIFICATIONS

#### Note remarks

Test sheet : IHC 7,6 T Edition : 09.12.88 Replaces : 19.02.88 Test oil : ISO-4113

Combination no. : 0 403 446 198

Injection pump

Pump designation: PES6MW100/320RS1160

: 0 413 406 147 EP type number

Governor

Governor design. : RQV350...1200MW46-16

: 0 420 083 147 Governer no.

Customer spec. information Customer : NAVISTAR

Engine : DTA-466

1st version kW : 176.4 Rated speed : 2400

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 037

Inlet press., bar: 2.80

Test nozzle holder

: 1 688 901 016 assembly

**Openina** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,5

Test lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 4.00...4.10 : (3.95...4.15) Prestroke mm

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 800

Rack travel in mm : 12.30...12.40

Del.quantity cm3/: 11.8...12.0

100 s: (11.6...12.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0Rack travel in mm: 6.5...6.6 Del.quantity cm3/: 1.6..2.0 100 s: (1.3..2.2) Spread cm3: 0.3 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

: 8.30...8.50 rpm : 1460 travel mm 2nd speed

travel mm

: 9.10...9.50

3rd speed rpm : 550 travel mm

: 3.10...3.70 : 350 4th speed rpm

: 1.30...1.70 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800 Aneroid pressure h: 800

: 118.0...120.0 Del.quantity

1000 : (116.0...122.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 44...49

Testina:

1st rack travel in: 11.30 Speed rpm : 1260...1280

2nd rack travel in: 4.00

rpm : 1385...1395 Speed

4th rack travel in: 1500

Speed rom : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 12...20

Setting point w/out bumper spring

Speed rpm : 350 Rack travel in mm : 6.5

Testing:

Speed : 100 rpm Minimum rack trave: 9.00 Speed rpm : 350

Rack travel in mm : 6.50...6.60

CONSTANT REGULATION

rpm : 300...450 Speed

Aneroid/Altitude Compensator Test

1st version Setting

Speed rpm : 800 hPa : 180 Pressure

Rack travel mm : 10.30...10.40

Measurement

1/min: 800 Speed

1st pressure hPa : -

Rack travel in m: 10.00...10.10

2nd pressure hPa : 480

Rack travel in m: 11.80...12.10 3rd pressure hPa : 800

Rack travel in m: 12.30...12.40

START CUT-GUT

Speed 1/min: 180 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 800 Speed rpm : 1200

Del.quantity cm3/: 120.0...124.0 1000 s: (118.0...126.0)

Spread cm3 : 6.50

1000 s: (7.0) Aneroid pressure h: -

A28

rpm : 800 Speed

Del.quantity cm3/: 80.0...82.0

1000 s: (78.0...84.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.30

rpm : 1260...1280 Speed

STARTING FUEL DELIVERY

LOW IDLE

Speed rpm : 350

Rack travel in mm : 6.50...6.60 Del.quantity cm3/: 16.0...20.0 1000 s: (13.5...22.5)

cm3 : 3.50Spread

1000 s: (5.50)

Remarks:

Perform pump setting only with IH hose with restriction of 1.2 mm diameter.

Before checking sleeve position, first adjust latching.

In unlatched condition, do not operate greater than n = 500 1/min

Set low idle at stop screw.

Set shutoff stop 1.5...2.0 mm before shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS : 4.00...4.10 : (3.95...4.15) Prestroke mm Rack travel in mm : 9.00...12.00 Note remarks Firing order : 1-5-3-6-2-4 : IHC 7,6 T 1 : 09.12.88 Test sheet Edition Replaces : 06.04.88 Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 403 446 199 Tolerance + - 0 : 0.50 (0.75) Injection pump BASIC SETTING Pump designation : PES6MW100/320RS1160 EP type number : 0 413 406 147 1st speed rpm: 800 Governor Governor design. : RQV350...1200Mw46-17 Rack travel in mm : 11.30...11.40 Governer no. : 0 420 083 148 Del.quantity cm3/: 10.1...10.3 Customer-spec. information Customer : NAVISTAR 100 s: (9.9...10.5) Engine : DTA-466 Spread cm3 : 0.3: 154.5 1st version kW 100 s: (0.6) Rated speed : 2400 rpm : 350.0 2nd speed TEST BENCH REQUIREMENTS Rack travel in mm: 6.3...6.4 Del.quantity cm3/: 1.6...2.0 Test oil 100 s: (1.3...2.2) inlet temp. °C : 38...42 cm3 : 0.3Spread 100 s: (0.5) Overflow valve : 2 417 413 037 (B) Setting of injection pump with governor Inlet press., bar: 2.80 GUIDE SLEEVE TRAVEL Test nozzle holder rpm : 1350 1st speed assembly : 1 688 901 016 travel mm : 8.30...8.50 2nd speed rpm : 1460 : 9.10...9.50 : 550 Opening | travel mm : 207...210 pressure, bar 3rd speed rpm : 3.10...3.70 : 350 travel mm Orifice plate 4th speed rpm diameter mm : 0,5 : 1.30...1.70 travel mm FULL LOAD DELIV. AT FULL LOAD STOP : 1 680 750 008 1st version Speed rom : 800 Aneroid pressure h: 800

Test lines

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_

BEGINNING OF DELIVERY Test pressure, bar: 30...32 RATED SPEED

Spread

Del.quantity

1st version Control lever

position degrees: 44...49

cm3

: 101.0...103.0 1000 : (99.0...105.0)

: 3.50

1000 : (6.00)

Testing: 1st rack travel in: 10.30 rpm : 1260...1280 Speed 2nd rack travel in: 4.00 rpm : 1375...1385 Speed 4th rack travel in: 1500 Speed rpm : 0.09...1.00LOW IDLE 1 Control Lever position degrees: 10...18 Setting point w/out bumper spring Speed rpm : 350 Rack travel in mm : 6.3 Testing: rpm : 100 Speed Minimum rack trave: 9.00 rpm : 350 Speed Rack travel in mm : 6.30...6.40 CONSTANT REGULATION Speed rpm : 300...450 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 LOW Pressure hPa : 190 Rack travel mm : 10.60...10.70 Measurement Speed 1/min: 500 1st pressure hPa : -Rack travel in m: 10.20...10.30 2nd pressure hPa : 290 Rack travel in m: 10.90...11.20 3rd pressure hPa : 800 Rack travel in m: 11.30...11.40 START CUT-OUT 1/min: 180 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 800

Speed rpm : 1200 Del.quantity cm3/: 104.0...108.0 1000 s: (102.0...110.0)

cm3 : 6.50 1000 s: (7.0)

Speed rpm : 500 Del.quantity cm3/ : 75.5...77.5 1000 s: (73.5...79.5) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.30 rpm : 1260...1280 Speed STARTING FUEL DELIVERY LOW IDLE Speed rpm : 350
Rack travel in mm : 6.30...6.40
Del.quantity cm3/: 16.0...20.0
1000 s: (13.5...22.5)
Spread cm3 : 3.50
1000 s: (5.50) Remarks: : Perform pump setting only with IH hose with restriction of 1.2 mm diameter. Before checking sleeve position, first adjust latching. In unlatched condition, do not operate greater than n = 500 1/minSet low idle at stop screw. Set shutoff stop 1.5...2.0 mm before shutoff.

B02

Spread

Aneroid pressure h: -

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 4.00...4.10 : (3.95...4.15) Note remarks Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Test sheet : IHC 7,6 R25 Edition : 09.12.88 : 27.10.88 Replaces Test oil : ISO-4113 : 0-60-120-180-240-300 Phasing Combination no. : 0 403 446 213 Tolerance + - 0 : 0.50 (0.75) Injection pump BASIC SETTING Pump designation : PES6MW100/320RS1112 : 0 413 406 108 EP type number 1st speed rpm: 900 Governor Governor design. : RQV350...1300MW72-4 Rack travel in mm : 10.80...10.90 : 0 420 083 170 Governer no. Del.quantity cm3/: 10.3...10.5 Customer-spec. information Customer : NAVISTAR 100 s: (10.1...10.7) : DT-466 Engine Spread cm3 : 0.31st version kW : 154.5 100 s: (0.6) Rated speed : 2600 rpm : 350.02nd speed Rack travel in mm : 5.5...5.6 Del.quantity cm3/ : 1.6...2.0 TEST BENCH REQUIREMENTS 100 s: (1.3...2.2) cm3 : 0.3 100 s: (0.5) Test oil inlet temp. °C : 38...42 Spread Overflow valve : 2 417 413 037 (B) Setting of injection pump with governor Inlet press., bar: 2.80 GUIDE SLEEVE TRAVEL Test nozzle holder 1st speed rpm : 1460 : 1 688 901 016 assembly travel mm : 9.10...9.50 rpm : 1350 2nd speed : 8.30...8.50 rpm : 550 : 3.10...3.70 Opening travel mm : 207...210 pressure, bar 3rd speed travel mm Orifice plate rpm : 3504th speed diameter mm : 0,5 : 1.30...1.70 travel mm FULL LOAD DELIV. AT FULL LOAD STOP Test lines : 1 680 750 008 1st version Outside diameter Speed rpm : 900 x Wall thickness Aneroid pressure h: 800 Anerou Del.quantity 1000 x Length mm : 6.00x2.00x600 : 103.0...105.0

: (101.0...107.0) : 3.50 cm3

Spread 1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 43...51

Test pressure, bar: 30...32

per values

BEGINNING OF DELIVERY

(A) Injection pump setting values

Set equal delivery quant.

Insp. values in parentheses

**B03** 

Testing:

1st rack travel in: 9.80

Speed rpm: 1365...1385 2nd rack travel in: 4.00

rpm : 1470...1480 Speed

4th rack travel in: 1600

Speed rpm : 0.00...1.00

LOW IDLE 1 Control Lever

position degrees: 9...17

Setting point w/out bumper spring

Speed rpm : 350 Rack travel in mm : 5.5

Testing:

Speed rom : 100

Minimum rack trave: 7.30

rom

Rack travel in mm : 5.50...5.60

CONSTANT REGULATION

rpm : 390...480 Speed

START CUT-OUT

1/min: 180 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 800

Speed rpm : 1300 Del.quantity cm3/: 105.0...109.0 1000 s: (103.0...111.0)

Spread cm3 : 5.00

1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.80

rpm : 1365...1385 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 140.0...180.0 1000 s: (137.0...183.0) Rack travel in mm: 19.00...21.00

LOW IDLE

: 350 Speed rpm

B04

Rack travel in mm : 5.50...5.60 Del.quantity cm3/ : 16.0...20.0 1000 s: (13.5...22.5)

Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

Perform pump setting only with IH hose with restriction of 1.2 mm diameter.

Before checking sleeve position, first adjust latching.

In unlatched condition, do not operate greater than n = 500 1/min

Set low idle at stop screw.

Set shutoff stop 1.5...2.0 mm before shutoff.

#### BOSCH INJ. PUMP TEST SPECIFICATIONS : 4.00...4.10 Prestroke mm : (3.95...4.15) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Note remarks Test sheet : IHC 7,6 T 2 Edition : 09.12.88 Replaces : 04.11.88 Test oil : ISO-4113 Phasina : 0-60-120-180-240-300 Combination no. : 0 403 446 214 Tolerance + - 0 : 0.50 (0.75) Injection pump Time to cyl. no. : 1 Pump designation : PES6MW100/320RS116D EP type number : 0 413 406 147 BASIC SETTING Governor Governor design. : RQV350...1300MW46-18 1st speed rpm: 900 Governer no. : 0 420 083 171 Rack travel in mm: 11.80...11.90 Customer-spec. information Customer : NAVISTAR Del.quantity cm3/: 10.8...11.0 100 s: (10.6...11.2) Engine : DTA-466 1st version kW : 156.0 Spread cm3 : 0.3Rated speed : 2600 100 s: (0.6) TEST BENCH REQUIREMENTS 2nd speed rpm : 350.0Test oil Rack travel in mm: 6.3...6.5 Del.quantity cm3/: 1.6...2.0 100 s: (1.3...2.2) Spread cm3 : 0.3 inlet temp. °C : 38...42 Overflow valve : 2 417 413 037 100 s: (0.5) Inlet press., bar: 2.80 (B) Setting of injection pump with governor Test nozzle holder : 1 688 901 016 assembly GUIDE SLEEVE TRAVEL rpm : 1460 1st speed Opening : 9.10...9.50 travel mm : 207...210 rpm : 1350 pressure, bar 2nd speed : 8.30...8.50 travel mm Orifice plate rpm : 550 3rd speed diameter mm : 0,5 travel mm 4th speed travel mm Test lines : 1 680 750 008 Outside diameter x Wall thickness 1st version x Length mm : 6.00X2.00X600 Speed (A) Injection pump setting values

: 3.10...3.70 rpm : 350 : 1.30...1.70 FULL LOAD DELIV. AT FULL LOAD STOP rpm : 900 Aneroid pressure h: 800 Aneroru p. Del.quantity 1000 : 108.0...110.0 : (106.0...112.0) Spread cm3 : 3.50 1000 : (6.00) RATED SPEED 1st version

Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Control lever

position degrees: 42...50

Testina:

1st rack travel in: 10.80

Speed rpm : 1355...1375

2nd rack travel in: 4.00

rpm : 1475...1485 Speed

4th rack travel in: 1600

Speed rpm : 0.00...1.00

LOW IDLE 1 Control Lever

position degrees: 8...16

Setting point w/out bumper spring

rpm : 350 Rack travel in mm: 6.4

Testing:

Speed : 100 rom Minimum rack trave: 9.00 : 350 man

Rack travel in mm : 6.30...6.50

CONSTANT REGULATION

rpm : 300...450 Speed

Aneroid/Altitude Compensator Test

1st version

Settina

Speed : 500 rpm hPa : 800 Pressure

Rack travel mm : 11.80...11.90

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.10...10.20

2nd pressure hPa : 165

Rack travel in m: 10.60...10.70

3rd pressure hPa : 360

Rack travel in m: 11.20...11.50

START CUT-OUT

Speed 1/min: 180 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 800 Speed rpm : 1300

Del.quantity cm3/: 111.5...114.5 1000 s: (109.0...117.0)

Spread

cm3 : 5.00 1000 s: (7.0)

Aneroid pressure h: rpm : 500 Speed

Del.quantity cm3/: 73.0...75.0 1000 s: (71.0...77.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.80

rpm : 1355...1375 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 140.0...180.0 1000 s: (137.0...183.0) Rack travel in mm: 19.00...21.00

LOW TDIF

Speed rpm : 350 Rack travel in mm : 6.30...6.50 Del.quantity cm3/: 16.0...20.0

1000 s: (13.5...22.5)

Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

Perform pump setting only with IH hose with restriction of 1.2 mm diameter.

Before checking sleeve position, first adjust latching.

In unlatched condition, do not operate greater than n = 500 1/min

Set low idle at stop screw.

Set shutoff stop 1.5...2.0 mm before shutoff.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

# Note remarks

Test sheet : MB 6,0 D 61 Edition : 24.02.89

Replaces

Test oil : ISO-4113

Combination no. : 0 403 446 215

Injection pump

Pump designation : PES6MW100/720RS1131

EP type number : 0 413 406 123

Governor

Governor design. : RQV300...1300MW50-5

: 0 420 083 187 Governer no.

Customer-spec. information

Customer : DB

: OM 366 LA Engine

1st version kW : 146.0 Rated speed : 2600

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

**Opening** 

: 172...175 pressure, bar

Test Lines : 1 680 715 015

Outside diameter

x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80 : (3.65...3.75)

Rack travel in mm : 9.00...12.00

207

Firing order : 1-5-3-6-2-4

Phasina : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

BASIC SETTING

rpm: 13001st speed

Rack travel in mm : 12.00...12.10

Del.quantity cm3/: 8.9...9.1

100 s: (8.7...9.3)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 300.0 2nd speed Rack travel in mm: 6.0...6.2 Del.quantity cm3/: 0.7...1.1

100 s: (0.4...1.3)

Spread cm3 : 0.3100 s: (0.5)

# (B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1450 1st speed

: 9.50...9.90 travel mm

rpm : 1350 2nd speed

travel mm : 8.50...8.70

3rd speed : 500 rpm

: 2.70...3.30 travel mm

rpm : 300 4th speed

travel mm : 1.20...1.60

# GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1300 Speed

Rack travel in mm : 15.20...17.80

# FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300Aneroid pressure h: 700

Del.quantity : 89.0...91.0 1000 : (87.0...93.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control Lever position degrees: 51...59 Testina: 1st rack travel in: 11.00 Speed rpm : 1340...1350 2nd rack travel in: 4.00 rpm : 1440...1470 Speed 4th rack travel in: 1550 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 14...22 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 6.1 Testina: Speed rpm : 100 Minimum rack trave: 7.80 Speed rpm : 300 Rack travel in mm : 6.00...6.20 Aneroid/Altitude Compensator Test 1st version Setting rpm : 500 hPa : 300 mm : 11.70...11.80 Speed rpm Pressure Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 10.60...10.70 2nd pressure hPa : 230 Rack travel in m: 10.90...11.20 3rd pressure hPa : 700 Rack travel in m: 12.00...12.10 START CUT-OUT 1/min : 200 (230) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 rpm : 600 Speed Del.quantity cm3/: 74.0...77.0 1000 s: (71.5...79.5) cm3 : 5.00Spread 1000 s: (7.0)

Speed rpm : 500
Del.quantity cm3/ : 51.0...53.0
 1000 s: (49.0...55.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.00 Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 83.0...93.0 1000 s: (80.0...96.0)

LOW IDLE

:

Remarks:

B08

Aneroid pressure h: -

#### Note remarks

Test sheet : MB 6,0 D 55 Edition : 07.02.89

Replaces

Test oil : ISO-4113

Combination no. : 0 403 446 216

Injection pump

Pump designation : PES6MW100/720RS1144-

: 0 413 406 159 EP type number

Governor

Governor design. : RQV300...1400MW48-8

Governer no. : 0 420 083 175

Customer-spec. information

Customer : DB

Engine : OM 366 A

: 125.0 1st version kW Rated speed : 2800

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening |

: 172...175 pressure, bar

Test lines : 1 680 715 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60

: (3.45...3.65)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasina : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1400

Rack travel in mm : 10.70...10.80

Del.quantity cm3/: 7.5...7.7

100 s: (7.3...7.9)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rom : 300.0Rack travel in mm: 8.5...8.7

Del.quantity cm3/: 0.9...1.3

100 s: (0.6...1.5) cm3 : 0.3 Spread

100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1550

: 9.10...9.50 travel mm

rpm : 1450 2nd speed

: 8.30...8.50 travel mm

3rd speed rpm :

500 2.50...3.10 travel mm

rpm : 3004th speed

: 1.00...1.40 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1430 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1400

: 75.0...77.0 Del.quantity

1000 : (73.0...79.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control lever position degrees: 49...57 Testing: 1st rack travel in: 9.70 Speed rpm : 1440...1450 2nd rack travel in: 4.00 Speed rpm : 1535...1565 4th rack travel in: 1650 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 18...26 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 8.6 Testing: rpm : 100 Speed Minimum rack trave: 10.00 Speed rpm: 300 Rack travel in mm : 8.50...8.70 TORQUE CONTROL Dimension a mm : 1.50 Torque control curve - 1st version 1st speed rpm : 1400 Rack travel in m: 10.70...10.80 2nd speed rpm : 750 Rack travel in m: 12.20...12.30 3rd speed rpm : 950 Rack travel in m: 11.70...11.90 4th speed rpm : 1200 Rack travel in m: 10.80...11.10 START CUT-OUT 1/min : 200 (230) Speed FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 750 Del.quantity cm3/ : 74.5...77.5 1000 s: (72.0...80.0) cm3 : 5.00Spread 1000 s: (7.0) **BREAKAWAY** 1st version

# 1mm rack travel less than full load rack tr: 9.70 Speed rpm : 1440...1450

# STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 78.0...88.0 1000 s: (75.0...91.0)

# LOW IDLE

Speed rpm: 300 Rack travel in mm: 8.50...8.70 Del.quantity cm3/: 9.0...13.0 1000 s: (6.5...15.5) Spread cm3 : 3.50 1000 s: (5.50)

Remarks:

B10

#### Note remarks

Test sheet Edition : MB 6,0 0 56 : 22.12.88

Replaces

Test oil : ISO-4113

Combination no. : 0 403 446 217

Injection pump

Pump designation : PES6MW100/720RS1144-

EP type number : 0 413 406 159

Governor

Governor design. : RQV300...1300mW48-9

Governer no. : 0 420 083 176

Customer-spec. information

Customer : DB

Engine : 0M366A

: 125.0 1st version kW Rated speed : 2600

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening.

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80

: (3.65,..3.85)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1300

Rack travel in mm : 11.00...11.10

Del.quantity cm3/: 7.7...7.9

100 s: (7.5...8.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0 Rack travel in mm : 7.8...8.0 Del.quantity cm3/: 0.9...1.3

100 s: (0.6...1.5)

Spread cm3 : 0.3100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1440

: 9.30...9.70 travel mm

rpm : 1350 2nd speed

travel mm : 8.60...8.80

3rd speed 500 rpm

: 2.70...3.30 : 300 travel mm

4th speed rpm

: 1.20...1.60 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1350 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1300 Speed

: 77.0...79.0 Del.quantity

1000 : (75.0...81.0)

: 3.50 Spread cm3 1000 : (6.00)

RATED SPEED

1st version Control lever position degrees: 48...56 Testing: 1st rack travel in: 10.00 Speed rpm : 1340...1350 2nd rack travel in: 4.00 Speed rpm : 1425...1455 4th rack travel in: 1550 Speed rpm : 0.00...1.00 LOW IDLE 1 Control Lever position degrees: 18...26 Setting point w/out bumper spring Speed rpm: 300 Rack travel in mm: 7.9 Testing: Speed rpm : 100 Minimum rack trave: 9.50 Speed rpm : 300 Rack travel in mm : 7.80...8.00 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1300 Rack travel in m: 11.00...11.10 2nd speed rpm : 800 Rack travel in m: 11.50...11.80

3rd speed rpm : 585

Rack travel in m: 12.00...12.20 4th speed rpm : 1100 Rack travel in m: 11.00...11.20 START CUT-OUT 1/min: 230 (250) Speed FUEL DELIVERY CHARACTERISTICS 1st version rpm : 800 Speed Del.quantity cm3/: 75.5...78.5 1000 s: (73.0...81.0) cm3 : 5.00Spread 1000 s: (7.0) Speed rpm : 585 Del.quantity cm3/ : 68.5...71.5 1000 s: (66.0...74.0) **BREAKAWAY** 1st version 1mm rack travel less than

Speed rpm : 1340...1350 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 78.0...88.0 1000 s: (75.0...91.0) LOW IDLE Speed rpm : 300 Rack travel in mm: 7.80...8.00 Del.quantity cm3/": 9.0...13.0 1000 s: (6.5...15.5) cm3 : 3.50 1000 s: (5.50) Spread Remarks:

B12

full load rack tr: 10.00

#### Note remarks

Test sheet : MB 6,0 D 59 Edition : 07.02.89

Replaces

Test oil : ISO-4113

Combination no. : 0 403 446 219

Injection pump

Pump designation : PES6MW100/720RS1120

EP type number : 0 413 406 112

Governor

Governor design. : RQV300...1300MW59-1

: 0 420 083 181 Governer no.

Customer-spec. information

Customer : DB

Engine : 0M366LA

1st version kW : 141.7 Rated speed : 2600

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Openina

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60 : (3.45...3.65)

Rack travel in mm : 9.00...12.00

**B13** 

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 12.10...12.20

Del.quantity cm3/: 8.6...8.8

100 s: (8.4...9.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0Rack travel in mm: 6.0...6.2 Del.quantity cm3/: 0.9...1.3

100 s: (0.7...1.5) cm3 : 0.3Spread

100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1460

travel mm : 9.50...9.90 : 1350 2nd speed rpm

: 8.50...8.70 travel mm

: 500 3rd speed rom

: 2.70...3.30 : 300 travel mm

4th speed rpm

: 0.70...1.10 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1325 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rom : 1300 Aneroid pressure h: 700

Del.quantity : 86.0...88.0

1000 : (84.0...90.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control Lever position degrees: 51...59 Testina: 1st rack travel in: 11.10 rpm : 1340...1350 Speed 2nd rack travel in: 4.00 rpm : 1450...1480 Speed 4th rack travel in: 1530 Speed rpm : 0.00...1.00LOW IDLE 1 Control Lever position degrees: 14...22 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 6.1 Testina: rom : 100 Speed Minimum rack trave: 7.60 rpm : 300 Rack travel in mm: 6.00...6.20 CONSTANT REGULATION rpm : 320...550 Speed Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rpm hPa : 310 Pressure : 11.80...11.90 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 11.00...11.10 2nd pressure hPa : 280 Rack travel in m: 11.20...11.50 3rd pressure hPa : 700 Rack travel in m: 12.10...12.20 START CUT-OUT Speed 1/min: 230 (250) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 rpm\_ : 750 Speed Del.quantity cm3/: 75.5...78.5 1000 s: (73.0...81.0)

Spread cm3 : 5.00 1000 s: (7.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 47.0...49.0 1000 s: (45.0...51.0) BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.10 Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 83.0...93.0 1000 s: (80.0...96.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.00...6.20
Del.quantity cm3/ : 9.0...13.0
1000 s: (7.0...15.0)
Spread cm3 : 3.50

1 cm3 : 3.50 1000 s: (5.50)

Remarks:

**B14** 

Note remarks

Test sheet : MTU 22,4 e Edition : 2.3.89

Replaces

Test oil : ISO-4113

Combination no. : 0 406 036 027

Injection pump

Pump designation : PE6ZWM120/410/3RS28/

EP type number : 0 416 026 002

Governor

Governor design. : RQU300/700ZWA42L Governer no. : 0 422 404 010

Customer-spec. information Customer

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 40...45

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 443 022

Openina

pressure, bar : 172...175

Test lines : 1 680 750 027

Outside diameter x Wall thickness

: 8,00X2,00X1500 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Prestroke mm : 2.00...2.10

: (1.95...2.15)

Rack travel in mm: 12.00

Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300

Tolerance + - ° : 00.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 600

Rack travel in mm: 18.00

Del.quantity cm3/: 33.6...34.2

100 s: (33.3...34.5)

cm3 : 1.0Spread

100 s: (1.5)

rpm : 600 2nd speed Rack travel in mm: 6.00 Del.quantity cm3/: 7.9...9.9

100 s: (7.5...10.3)

Spread cm3 : 1.1

100 s: (1.6) rpm : 250 3rd speed

Rack travel in mm: 6.00 Del.quantity cm3/: 4.0...5.6 100 s: (3.6...6.0)

Spread cm3 : 1.0

100 s: (1.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: 55...61 rpm : 450

Speed Rack travel in mm: 22.00

RATED SPEED

1st version

Setting point:

Speed rpm : 450 Rack travel in mm: 22.0

Testing:

1st rack travel in: 21.00 Speed rpm : 705...720 2nd rack travel in: 4.00

Speed rpm : 765...795 4th rack travel in: 810

Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring

rpm : 300 Rack travel in mm: 7.00

Testing:

Speed rpm : 225 Minimum rack trave: 12.00

Speed rpm: 375
Rack travel in mm: 2.00...3.50
Rack travel in mm: 2.75
Speed rpm: 355...395
Speed rpm: 700

Maximum rack trave: 2.00 Rack travel in mm : <0.01 Speed rpm : 720...740

#### **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 21.00 rpm : 705...720 Speed

Remarks:

Full-load delivery is set on engine according to engine test report.

Stamp dimension "O". Control-rod travel "O" corresponds to 1.0 mm clearance of the control-collar capsule from the end-face stop plate.

Note remarks

Test sheet : MTU 31,7 j Edition : 3.3.89

Replaces

Test oil : ISO-4113

Combination no. : 0 406 038 999

Injection pump

Pump designation : PEV8ZWM160/120RS1040

EP type number : 0 416 068 999

Governor

: RQU425...600/13007WA Governor design.

62-2

: 0 422 405 020 Governer no.

Customer-spec. information Customer : MTU

Engine : MB 871

TEST BENCH REQUIREMENTS

Test oil

Outlet temp, °C : 42...45

Overflow valve

Overflow

quantity min. 1/h: 600...720

Test nozzle holder

assembly : 0 681 443 022

Openina

pressure, bar : 172...175

Test Lines : 1 680 750 069

Outside diameter x Wall thickness

x Length mm : 8,00X2,00X1500

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Prestroke mm : 2.50...2.60

: (2.45...2.65)

Rack travel in mm: 12.00

Firing order : 8-2-1-6-4-3-5-7 Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm: 9.00

Del.quantity cm3/: 26.5...27.9 \*

100 s: (26.2...28.2)

Spread cm3 : 1.6

100 s: (2.4)

2nd speed rpm : 425

Rack travel in mm : 6.30...6.50 Del.quantity cm3/: 8.0...9.0

100 s: (-)

Spread cm3 : 1.6 100 s: (-)

1st speed rpm : 1300 Rack travel in mm: 9.00

Del.quantity cm3/: 25.1..26.5\*\*

100 s: (24.8...26.8

Spread cm3 : 1.6 100 s: (2.4)

rpm : 425

2nd speed Rack travel in mm : 6.30...6.50

Del.quantity cm3/: 6.4...7.4 100 s: (-)

cm3 : 1.6 Spread

100 s: (-) GUIDE SLEEVE POSITION

Control-lever position

Degree: 45...55 rpm : 800 Speed

Rack travel in mm : 12.00...12.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1300 Speed

: 450.0...454.0 \* Del.quantity

1000 : (447.0...457.0)

Spread : 8.0 cm3

1000 : (12.0)

2nd version

Speed rpm : 1300 Del.quantity cm3/ : 436.0...440.0\*\* 1000 s: (433.0...443.0)

Spread

cm3 : 8.0

1000 s: (12.0)

#### RATED SPEED

1st version Control lever

position degrees: 52...58

Testing:

1st rack travel in: 13.80

rpm : 1325...1340 Speed

2nd rack travel in: 4.00

rpm : 1420...1460 Speed

3rd rack travel in: <0.01

rpm : 1460...1520 Speed

LOW IDLE 1

Control lever

position degrees: 13...19

Setting point w/out bumper spring

: 425 rpm

Rack travel in mm : 6.50...6.70

: 300 Speed rpm

Rack travel in mm : 11.00...12.00

Rack travel in mm : 3.70

rpm : 480...520

Rack travel in mm : <0.01

: 540...615 Speed rpm

CONSTANT REGULATION

Speed rpm : 800...1300

#### **BREAKAWAY**

1st version

Speed : 1325...1380 rpm

#### Remarks:

\* = Bank A = cyl. 1-3-6-8

\*\* = Bank B = cyl. 2-4-5-7

Note mounting and test instructions KH/VSK 40 JP 1.

Set with adjusting gauge KDEP 1533.

Inlet pressure 3 bar with overflow quantity 10...12 1/min (measured at return).

Instead of oveflow valve, connect a hand valve of minimum nominal size 1/2" into the return.

Oveflow quantity as well as inlet pressure must be observed precisely. Note further that the calibratingoil temperature 42°...45° C must be measured at the return.

Set intermediate-speed stop at 00 1/min

#### Note remarks

: DEE 7,6 j Test sheet : 3.3.89 Edition Replaces : 7.86 Test oil : ISO-4113

Combination no. : 9 400 230 047

Injection pump

Pump designation : PES6A95D41ORS2561

Governor

Governor design. : RSV600...1100A2B2049

Customer-spec. information Customer : JOHN DEERE

Engine : 6466 T

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 413 385 007

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter x Wall thickness

: 6,00x2,00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

# BEGINNING OF DELIVERY

: 1.85...1.95 : (1.80...2.00) Prestroke mm

Rack travel in mm: 10.50

Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 10.70...10.80

Del.quantity cm3/: 10.7...10.9

100 s: (10.4...11.2)

cm3 : 0.3Spread

100 s: (-)

rpm : 600 2nd speed

Rack travel in mm : 5.00...5.20 Del.quantity cm3/: 1.2...1.6

100 s: (1.0...1.8)

Spread cm3 : 0.3

100 s: (-)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1100 : 107.0...109.0 Del.quantity

1000 : (104.0...112.0)

cm3 : 3.0 1000 : (-) Spread

RATED SPEED

1st version

Control lever

position degrees: 44...52

Testing:

1st rack travel in: 9.70 Speed rpm : 1145...1155

2nd rack travel in: 4.00

rpm : 1200...1230 Speed

4th rack travel in: 1300

Speed rpm : 0.30...1.70

LOW IDLE 1 Control Lever position degrees: 25...33

Setting point w/out bumper spring

Speed rpm : 600 Rack travel in mm: 4.6

Testing:

Speed rpm : 100 Minimum rack trave: 19.00

Speed rpm : 600
Rack travel in mm : 5.00...5.20
Rack travel in mm : 2.00
Speed rpm : 720...780

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 10.70...10.80

2nd speed rpm : 950

Rack travel in m: 11.45...11.65

FUEL DELIVERY CHARACTERISTICS

1st version

: 950 Speed rom

Del.quantity cm3/: 120.0...124.0 1000 s: (118.0...126.0)

Spread cm3 : 3.0

1000 s: (-)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 9.70

rpm : 1145...1155 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 165.0...185.0 1000 s: (-)

Rack travel in mm: 21.00

HIGH IDLE

1st version

Speed rpm : 1200

Rack travel in mm : 19.0...29.0

Del.quantity cm3/: (-)

LOW IDLE

Speed rpm : 600 Del.quantity cm3/: 12.0...16.0

1000 s: (-)

Remarks:

: JOHN DEERE # RE10473

Start-of-delivery mark = 15.5° after

start of delivery cyl. 1.

Adjustment without torque-control spring retainer with 1 mm less control-rod travel. Increase in

full-load delivery with torque-control

spring retainer.

Note remarks

Test sheet : CUM 8,3 b 6 Edition : 3.3.89

Replaces

Test oil : ISO-4113

Combination no. : 9 400 230 092

Injection pump

Pump designation : PES6A100D320/3RS2691

Governor

Governor design. : RQV350...1100AB1216R

Customer-spec. information Customer : CDC

Engine : 6 CT 8.3

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 017

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6,00X2,00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 10.50

Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 12.70...12.80

Del.quantity cm3/: 12.7...12.9

100 s: (12.5...13.1)

cm3 : 0.35Spread

100 s: (0.6)

rpm : 350 2nd speed

Rack travel in mm : 5.70...5.90

Del.quantity cm3/: 1.6...2.0

100 s: (-)

cm3 : 0.35Spread

100 s: (0.55)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

Aneroid pressure h: 600

1000 : (6.0)

RATED SPEED

1st version

Control lever

position degrees: 61.5...66.5

Testing:

1st rack travel in: 11.70

Speed rpm: 1150...1160 2nd rack travel in: 4.00

Speed rpm : 1265...1295 4th rack travel in: 1350

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 12...20

Setting point w/out bumper spring

Speed rpm: 350
Rack travel in mm: 5.8
Speed rpm: 350
Rack travel in mm: 5.8

Rack travel in mm : 5.70...5.90

Rack travel in mm : 2.00 Speed rom : 525...585 TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version

1st speed rpm : 1100 Rack travel in m: 12.70...12.80

2nd speed rpm : 850

Rack travel in m: 12.90...13.10

3rd speed rpm : 750

Rack travel in m: 13.10...13.30

Aneroid/Altitude Compensator Test

1st version Setting Speed rpm

: 500 Pressure hPa : 340

Rack travel mm : 12.35...12.45

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.80....10.00

2nd pressure hPa : 190 Rack travel in m: 10.60...11.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 600

Speed rpm : 750 Del.quantity cm3/ : 133.0...137.0

1000 s: (131.0...139.0) cm3 : 3.5

Spread 1000 s: (6.0)

Aneroid pressure h: -

Speed rpm: 500
Del.quantity cm3/: 69.5...73.5
1000 s: (67.5...75.5)
Spread cm3: 3.5
1000 s: (-)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.70

Speed rpm : 1150...1160

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 160.0 1000 s: (155.0)

Rack travel in mm : 21.00

LOW IDLE

Speed rpm : 350 Del.quantity cm3/ : 16.0...20.0 1000 s: (13.5...22.5)

Spread cm3 : 3.5 1000 s: (-)

Remarks:

Adjust stop lever to 0.5...1.0 mm before stop.

Start-of-delivery mark 9° cam angle after start of delivery cyl. 1.

#### Note remarks

Test sheet : CUM 8,3 j Edition : 01.09.88 Replaces : 15.6.88 Test oil : ISO-4113

Combination no. : 9 400 230 096

Injection pump

Pump designation : PES6A100D320/3RS2691

EP type number : 9 410 230 025

Governor

: RSV425...900A4c2213-Governor design.

1R

: 9 420 234 136 Governer no.

Customer-spec. information Customer : C.D.C.

Engine : 6 CTI-8.3 L

: 154.0 1st version kW : 1800 Rated speed

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 017 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test Lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90 : (2.75...2.95)

Rack travel in mm: 10.50

Firing order : 1-5-3-6-2-4

Phasina : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 1

#### BASIC SETTING

1st speed rpm: 830

Rack travel in mm : 13.40...13.50

Del.quantity cm3/: 13.5...13.7

100 s: (13.3...13.9)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 425.0 2nd speed Rack travel in mm : 5.5...5.7

Del.quantity cm3/: 1.2...1.6 100 s: (0.9...1.8)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION

Speed rpm : 800 Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 830

Del.quantity : 135.0...137.0

: (133.0...139.0) : 3.50 1000

Spread cm3

> 1000 : (6.00)

# RATED SPEED

1st version Control lever

position degrees: 49...57

Testing:

1st rack travel in: 12.40 rpm : 925...935 Speed

2nd rack travel in: 4.00 rpm : 960...990 Speed 4th rack travel in: 1030 Speed rpm : 0.30...1.40 LOW IDLE 1 Control Lever

position degrees: 24...32 Setting point w/out bumper spring

Speed rpm : 425 Rack travel in mm : 5.0

Testing:

Speed : 100 rpm Minimum rack trave: 19.00 Speed rpm : 425

Rack travel in mm : 5.40...5.60 Rack travel in mm : 2.00

rpm : 435...495 Speed

#### **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 12.40 Speed rpm : 925...935

# STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 135.0...155.0 1000 s: (130.0...160.0)

Rack travel in mm : 19.00...21.00

# LOW IDLE

Speed rpm : 425
Rack travel in mm : 5.50...5.70
Del.quantity cm3/ : 12.0...16.0
1000 s: (9.5...18.5)

Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

: C.D.C # 3908844

Set shutoff stop 1.5...2.0 mm before shutoff.

Start-of-delivery mark at 10° cam rotation angle after start of delivery, cylinder 1

#### **APPLICATION**

Generator

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : CUM 8,3 j 1 Edition : 15.06.88 Replaces Test oil : ISO-4113 Combination no. : 9 400 230 096DA Injection pump Pump designation : PES6A100D320/3RS2691 EP type number : 9 410 230 025 Governor Governor design. : RSV425...900A4c2213-1R : 9 420 234 136 Governer no. Cust, part no. : 3908845 Customer-spec. information

Customer : C.D.C.

Engine : 6CT-I

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 017

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90 : (2.75...2.95)
Rack travel in mm : 10.50

: 1-5- 3- 6- 2- 4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 750

Rack travel in mm : 14.00...14.10

Del.quantity cm3/: 14.2...14.4

100 s: (14.0...14.6)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 425.0 2nd speed Rack travel in mm: 6.0...6.2 Del.quantity cm3/: 1.8...2.2

100 s: (1.5...2.4)

Spread cm3 : 0.3100 s: (0.5)

GUIDE SLEEVE POSITION Control-Lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Del.quantity : 142.5...144.5 : (140.5...146.5) 1000

Spread : 3.50 cm3

1000 : (6.00)

RATED SPEED

1st version Control Lever

position degrees: 37...45

Testina:

1st rack travel in: 13.00

: 795...805 Speed rpm 2nd rack travel in: 4.00 rpm : 825...855 Speed 3rd rack travel in: 4.00 rpm : 830...860 Speed LOW IDLE 1 Control lever position degrees: 19...27 Setting point w/out bumper spring rpm : 425 Speed Rack travel in mm: 5.6 Testing: Speed : 100 rpm Minimum rack trave: 19.00 rpm : 425 Rack travel in mm: 6.00...6.20 Rack travel in mm: 2.00 : 440...500 Speed rom **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.00 Speed rpm : 795...805 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 135.0...155.0 1000 s: (130.0...160.0) Rack travel in mm: 19.00...21.00 LOW IDLE Speed rpm: 425
Rack travel in mm: 6.00...6.20
Del.quantity cm3/: 18.0...22.0
1000 s: (15.5...24.5)
Spread cm3: 3.50 1000 s: (5.50) Remarks: Start-of-delivery mark at 10° cam rotation angle after start of delivery, cylinder 1 Adjust stop lever to 0.5...1.0 mm before stop. **APPLICATION** 

**B26** 

Generator

#### Note remarks

: CUM 8,3 k Test sheet Edition : 15.06.88

Replaces

Test oil : ISO-4113

Combination no. : 9 400 230 102

Injection pump

Pump designation : PES6A1000320/3RS2691

EP type number : 9 410 230 025

Governor

Governor design. : RSV400...1050A0C2216

: 9 420 234 146 Governer no.

Customer-spec. information Customer : C.D.C.

: 6 CTA 8.3 Engine

1st version kW : 141.7 Rated speed : 2100

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 017 assembly

Opening |

pressure, bar : 207...210

Orifice plate

diameter mm : 0.6

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

: 2.80...2.90 Prestroke mm : (2.75...2.95)

Rack travel in mm : 10.50...10.50 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

#### BASIC SETTING

rpm: 1050 1st speed

Rack travel in mm: 11.10...11.20

Del.quantity cm3/: 10.0...10.2

100 s: (9.8...10.4)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 400.0 2nd speed Rack travel in mm : 5.9...6.1 Del.quantity cm3/ : 1.8...2.2

100 s: (1.5...2.4)

Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

100.5...102.5 Del.quantity

: (98.5...104.5) : 3.50 : (6.00) 1000

Spread cm3

1000

#### RATED SPEED

1st version Control lever

position degrees: 43...51

Testina:

1st rack travel in: 10.10 Speed rpm : 1090...1100 2nd rack travel in: 4.00 Speed rpm : 1160...1190 4th rack travel in: 1250

Speed rpm : 0.30...1.40

LOW IDLE 1 Control Lever

position degrees: 25...34 Setting point w/out bumper spring

rpm : 400 Rack travel in mm: 5.5

Testing:

Speed : 100 rpm Minimum rack trave: 19.00 Speed rpm : 400

Rack travel in mm : 5.90...6.10 Rack travel in mm : 2.00

Speed rom : 495...555

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1050

Rack travel in m: 11.10...11.20

2nd speed rpm : 750

Rack travel in m: 12.60...12.80

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750 Del.quantity cm3/ : 126.0...130.0 1000 s: (124.0...132.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.10

Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm

Del.quantity cm3/: 135.0...155.0 1000 s: (130.0...160.0) Rack travel in mm: 19.00...21.00

LOW IDLE

rpm : 400 Speed

Rack travel in mm : 5.90...6.10 Del.quantity cm3/: 18.0...22.0 1000 s: (15.5...24.5)

cm3 : 3.50 1000 s: (5.50) Spread

Remarks:

Adjust stop lever to 0.5...1.0 mm before stop.

Adjustment without torque-control spring retainer with 1 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Start-of-delivery mark 11° cam angle after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : CUM 8,3 b Edition : 20.12.88 : 1.9.88 Replaces Test oil : ISO-4113 Combination no. : 9 400 230 103 Injection pump Pump designation : PES6A1000410RS2691-2 EP type number : 9 410 230 028 Governor Governor design. : RQV350...1100AB1227R : 9 420 231 015 Governer no. Customer-spec. information Customer : C.D.C. Engine : 6 CT 8.3 1st version kW : 156.6 Rated speed : 2200 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 047 Inlet press., bar: 1.50 Test nozzle holder assembly : 1 688 901 017 Opening | : 207...210 pressure, bar Orifice plate diameter mm : 0,6 Test lines : 1 680 750 014 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90 : (2.75...2.95) Rack travel in mm : 10.50 : 1-5-3-6-2-4 Firing order Phasing : 0-60-120-180-240-300 Tolerance + - 0 : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING

1st speed rpm: 1100 Rack travel in mm : 12.80...12.90

Del.quantity cm3/: 13.0...13.2 100 s: (12.8...13.4)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm: 350.0 Rack travel in mm: 5.6...5.8 Del.quantity cm3/: 1.8...2.2 100 s: (?.5...2.4) Spread cm3 : 0.3100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL 1st speed rpm : 1100 travel mm : 7.70...7.70 : 1150 2nd speed rpm travel mm : 8.00...8.60 3rd speed : 1290 rpm : 9.50...10.10 travel mm ; 350 4th speed rpm 1.20...1.60 travel mm 5th speed rpm : 600 : 3.90...4.50 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1290 Speed

Rack travel in mm : 6.70...9.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100 Aneroid pressure h: 900

: 130.5...132.5 1000 : (128.5...134.5) Del.quantity : 3.50 Spread cm3 1000 : (6.00) RATED SPEED 1st version Control lever position degrees: 60...68 Testing: 1st rack travel in: 11.80 rpm : 1150...1160 Speed 2nd rack travel in: 4.00 rpm : 1265...1295 Speed 4th rack travel in: 1350 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 9...17 Testing:

Speed rpm Minimum rack trave: 8.00 Speed rpm : 350
Rack travel in mm : 5.60...5.80
Rack travel in mm : 2.00 Speed : 420...480 rom

Aneroid/Altitude Compensator Test

1st version Setting : 500 Speed rpm hPa : 900 Pressure : 12.80...12.90 Rack travel mm

Measurement 1/min: 500 Speed

1st pressure hPa : -Rack travel in m: 10.10...10.30 2nd pressure hPa : 535

Rack travel in m: 12.10...12.20
3rd pressure hPa : 390
Rack travel in m: 10.70...11.10

START CUT-OUT

1/min: 260 (280) Speed

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 79.0...83.0

1000 s: (77.0...85.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.80

rpm : 1150...1160 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 165.0...185.0 1000 s: (160.0...190.0) Rack travel in mm : 15.30...15.70

LOW IDLE

Speed rpm : 350 Rack travel in mm: 5.60...5.80
Del.quantity cm3/: 18.0...22.0
1000 s: (15.5...24.5)
Spread cm3: 3.50
1000 s: (5.50)

Remarks:

: CDC # 3912645

Adjust stop lever to 0.5...1.0 mm before stop.

Start-of-delivery mark is at 7° after start of delivery.

CO2

# BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

Test sheet : CUM 8,3 k 1 Edition : 15.06.88

Replaces

Test oil : ISO-4113

Combination no. : 9 400 230 106

Injection pump

Pump designation : PES6A1000320/3RS2691

: 9 410 230 025 EP type number

Governor

: RSV400...1050A0c2216 Governor design.

-1R

: 9 420 234 154 Governer no.

Customer-spec. information Customer : C.D.C.

Engine : 6 CT 8.3

: 141.7 1st version kW : 2100 Rated speed

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 017 assembly

Opening

pressure, bar : 207...210

Orifice plate

: 0,6 diameter mm

Test Lines : 1 680 750 014

Outside diameter

x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 10.50...10.50

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.90...12.00

Del.quantity cm3/: 11.5...11.7

100 s: (11.3...11.9)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 400.0 2nd speed

Rack travel in mm : 5.8...6.0 Del.quantity cm3/ : 1.6...2.0 100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Speed Del.quantity 1000 : 115.0...117.0

: (113.0...119.0)

Spread cm3

: 3.50 : (6.00) 1000

RATED SPEED

1st version

Control Lever

position degrees: 42...50

Testing:

C03

1st rack travel in: 10.90 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 Speed rpm: 1145...1175 4th rack travel in: 1200

rpm : 0.30...1.40 Speed

LOW IDLE 1 Control lever

position degrees: 23...31 Setting point w/out bumper spring

rom : 400 Rack travel in mm: 5.4

Testina:

Speed riom : 100 Minimum rack trave: 19.00 Speed : 400 rpm

Rack travel in mm : 5.80...6.00 Rack travel in mm : 2.00

Speed : 470...530 COM

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1050

Rack travel in m: 11.90...12.00

2nd speed npm : 750

Rack travel in m: 13.20...13.40

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750 Del.quantity cm3/ : 134.0...138.0

1000 s: (132.0...140.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.90

Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100 bel.quantity cm3/ : 135.0...155.0 1000 s: (132.0...158.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400

Rack travel in mm : 5.80...6.00 Del.quantity cm3/: 16.0...20.0 1000 s: (13.5...22.5)

Spread cm3 : 3.501000 s: (5.50)

Remarks:

Adjust stop lever to 0.5...1.0 mm before stop.

Adjustment without torque-control spring retainer with 1 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Start-of-delivery mark 11° cam angle after start of delivery cyl. 1

Note remarks

: CUM 8,3 a 6 Test sheet : 20.12.88 : 30.9.88 Edition Replaces Test oil : ISO-4113

Combination no. : 9 400 230 109

Injection pump

Pump designation: PES6A100D320/3RS2691

EP type number : 9 410 230 030

Governor

: RSV450...1100A2c2190 Governor design.

-21R

: 9 420 234 164 Governer no.

Customer-spec. information Customer : C.D.C.

Engine : 6CT830

1st version kW : 117.1 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 017 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test Lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

: 2.80...2.90 : (2.75...2.95) Prestroke mm

Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 10.20...10.30

Del.quantity cm3/: 8.9...9.1

100 s: (8.7...9.3)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 450.0 2nd speed Rack travel in mm : 5.7...5.9 Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

: 89.0...91.0 Del.quantity 1000 : (87.0...93.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control Lever

position degrees: 47...55

Testing:

**CO5** 

1st rack travel in: 9.20 Speed rpm : 1140...1150 2nd rack travel in: 4.00 rpm : 1190...1220 Speed

3rd rack travel in: 4.00 rpm : 1195...1225 Speed

4th rack travel in: 1300

Speed rpm : 0.30...1.40

LOW IDLE 1 Control lever

position degrees: 29...37

Setting point w/out bumper spring

rpm : 450 Rack travel in mm: 5.3

Testina:

Speed rpm : 100 Minimum rack trave: 19.00

Speed rpm: 450
Rack travel in mm: 5.70...5.90
Rack travel in mm: 2.00

rpm : 525...585

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 10.20...10.30

2nd speed rpm : 750

Rack travel in m: 10.80...11.00

FUEL DELIVERY CHARACTERISTICS

1st version

rpm\_ : 750 Speed

Del.quantity cm3/: 90.5...94.5 1000 s: (88.5...96.5)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 9.20

Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...155.0

1000 s: (130.0...160.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 450 Rack travel in mm : 5.70...5.90

006

Del.quantity cm3/: 16.0...20.0 1000 s: (13.5...22.5)

cm3 : 3.50 Spread 1000 s: (5.50)

Remarks:

: C.D.C. # 3911541

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Start-of-delivery mark 11° cam angle after start of delivery cyl. 1

#### Note remarks

: CUM 8,3 a 7 Test sheet Edition : 20.12.88 : 30.9.88 Replaces Test oil : ISO-4113

Combination no. : 9 400 230 110

Injection pump

Pump designation: PES6A1000320/3RS2691

EP type number

Governor

: 9 410 230 030

Governor design.

: RSV450...1100A0c2190

-22r

Governer no. : 9 420 234 173

Customer-spec. information Customer : C.D.C.

Engine : 6CT830

: 150.6 1st version kW : 2200 Rated speed

# TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 017

**Opening** 

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test Lines : 1 680 750 014

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

#### BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 10.50

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

# BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 12.10...12.20

Del.quantity cm3/: 11.8...12.0

100 s: (11.6...12.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 450.0

Rack travel in mm : 5.7...5.9 Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3100 s: (0.5)

# GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

: 118.5...120.5 Del.quantity

1000 : (116.5...122.5)

: 3.50 Spread cm3

1000 : (6.00)

#### RATED SPEED

1st version

Control lever

position degrees: 42...50

Testing:

1st rack travel in: 11.10

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

rpm : 1195...1225 Speed

4th rack travel in: 1300

rpm : 0.30...1.40 Speed

LOW IDLE 1 Control lever

position degrees: 22...30

Setting point w/out bumper spring

Speed rpm: 450 Rack travel in mm: 5.3

Testina:

Speed rpm : 100

Minimum rack trave: 19.00

Speed rpm: 450
Rack travel in mm: 5.70...5.90
Rack travel in mm: 2.00
Speed rpm: 500...560

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 12.10...12.20

2nd speed rpm : 750

Rack travel in m: 13.20...13.40

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750

Del.quantity cm3/: 133.0...137.0 1000 s: (131.0...139.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.10

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...155.0 1000 s: (130.0...160.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

rpm : 450

Rack travel in mm : 5.70...5.90

Del.quantity cm3/: 16.0...20.0 1000 s: (13.5...22.5)

cm3 : 3.50 Spread 1000 s: (5.50)

Remarks:

: C.D.C. # 3911542

Adjustment without torque-control spring retainer with 1 mm less control-rod travel. Increase in

full-load delivery with torque-control spring retainer.

Start-of-delivery mark 11° cam angle after start of delivery cyl. 1

Limit shutoff stop screw to 1.0 mm.

#### Note remarks

Test sheet : CUM 8,3 a 8 Edition : 20.12.88 Replaces : 30.9.88

Test oil : ISO-4113

Combination no. : 9 400 230 111

Injection pump

Pump designation : PES6A100D320/3RS2691

-4

EP type number : 9 410 230 030

Governor

Governor design. : RSV450...1100A0c2190

-23R

Governer no. : 9 420 234 174

Customer—spec. information Customer : C.D.C.

Engine : 6CT830

1st version kW : 134.2 Rated speed : 2200

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 017

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

#### BEGINNING OF DELIVERY

SECTION OF SECTION

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90 : (2.75...2.95)

Rack travel in mm: 10.50

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Phasing

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 1

#### BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 11.20...11.30

Del.quantity cm3/: 10.1...10.3

100 s: (9.9...10.5)

Spread cm3:0.3

100 s: (0.6)

2nd speed rpm : 450.0 Rack travel in mm : 5.7...5.9 Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

# GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Speed rpm: 800 Rack travel in mm: 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1100

Del.quantity : 101.0...103.0 1000 : (99.0...105.0)

Spread cm3 : 3.50

1000 : (6.00)

# RATED SPEED

1st version Control lever

position degrees: 49...57

**CO9** 

Testina:

1st rack travel in: 10.20

Speed rpm : 1140...1150 2nd rack travel in: 4.00

rpm : 1210...1240 Speed 3rd rack travel in: 4.00

Speed rpm : 1215...1245 4th rack travel in: 1300

Speed rpm : 0.30...1.40

LOW IDLE 1 Control lever

position degrees: 31...39

Setting point w/out bumper spring rpm : 450 Rack travel in mm : 5.3

Testing:

rpm : 100 Speed Minimum rack trave: 19.00 rpm : 450

Rack travel in mm : 5.70...5.90 Rack travel in mm : 2.00

: 535...595 Speed rpm

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 11.20...11.30

2nd speed rpm : 750

Rack travel in m: 12.00...12.20

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750 Del.quantity cm3/ : 110.5...114.5 1000 s: (108.5...116.5)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.20

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

LOW IDLE

Speed rpm : 450

C10

Rack travel in mm : 5.70...5.90 Del.quantity cm3/: 16.0...20.0

1000 s: (13.5...22.5)

cm3 : 3.50 Spread 1000 s: (5.50)

Remarks:

: C.D.C. # 3911545

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Start-of-delivery mark 17° cam angle after start of delivery cyl. 1

Limit shutoff stop screw to 1.0 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : IHC 5,9 b : 20.12.88 : 30.9.88 Test sheet Edition Replaces Test oil : ISO-4113 Combination no. : 9 400 230 120 Injection pump Pump designation : PES6A95D32ORS2750 EP type number : 0 410 896 906 Governor Governor design. : RQV350...1350AB1236R : 9 420 231 021 Governer no. Customer-spec. information Customer : NAVISTAR Engine : MARS DTA360 1st version kW : 134.0 Rated speed : 2700 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 2 417 413 038 Inlet press., bar: 2.80 Test nozzle holder assembly : 1 688 901 110 Opening : 250...253 pressure, bar Orifice plate diameter mm : 0,5

Test Lines : 1 680 750 008

x Length mm : 6.00X2.00X600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 27...29

Outside diameter x Wall thickness

Prestroke mm : 2.75...2.85 : (2.70...2.90) Rack travel in mm : 10.50 : 1-5-3-6-2-4 Firing order Phasing : 0-60-120-180-240-300 Tolerance + - 0 : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 1350 Rack travel in mm : 11.10...11.20 Del.quantity cm3/: 7.3...7.5 100 s: (7.1...7.7) cm3 : 0.3Spread 100 s: (0.6) 2nd speed rpm : 350.0 Rack travel in mm : 5.2...5.4 Del.quantity cm3/ : 1.5...1.9 100 s: (1.2...2.1) Spread cm3 : 0.3100 s: (0.5) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 1400 : 8.50...8.50 rpm : 1500 travel mm 2nd speed

: 9.30...9.50 travel mm 3rd speed rpm : 350 : 1.00...1.00 travel mm 4th speed rpm : 450 travel mm : 1.90...2.40 5th speed : 250 rpm : 0.10...0.50 travel mm

GUIDE SLEEVE POSITION Control-lever position Degree: -1 Speed rpm : 1535

Rack travel in mm : 6.70...9.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version rpm : 1350 Speed Aneroid pressure h: 900

Del.quantity 73.0...75.0 1000 : (71.0...77.0) : 3.50 Spread cm3 1000 : (6.00) RATED SPEED 1st version Control lever position degrees: 45...53 Testing: 1st rack travel in: 10.10 rpm : 1415...1445 Speed 2nd rack travel in: 4.00 rpm : 1530...1540 Speed 4th rack travel in: 1600 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 8...16 Testing: Speed rpm : 250 Minimum rack trave: 7.80 Speed rpm : 350 Speed Rack travel in mm : 5.20...5.40 CONSTANT REGULATION rpm : 350...500 Speed Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rpm hPa : 900 Pressure : 11.10...11.20 Rack travel mm Measurement 1/min : 500 Speed 1st pressure hPa : -Rack travel in m: 8.80...9.00 2nd pressure hPa : 250 Rack travel in m: 10.00...10.10 3rd pressure hPa : 190 Rack travel in m: 9.30...9.70 START CUT-OUT Speed 1/min : 290 (300) FUEL DELIVERY CHARACTERISTICS 1st version

**C12** 

Aneroid pressure h: Speed rpm : 500
Del.quantity cm3/ : 57.0...61.0
1000 s: (55.0...63.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 10.10 Speed rpm : 1415...1445

STARTING FUEL DELIVERY

LOW IDLE

Remarks:

Limit shutoff stop screw to 1.0 mm.

Start-of-delivery mark is at start of delivery of cylinder 1

#### Note remarks

Test sheet : DEE 10,1 a3 Edition : 20.12.88 Replaces : 30.9.88 : ISO-4113 Test oil

Combination no. : 9 400 231 039

Injection pump

Pump designation : PES6P110A720RS370 : 0 412 016 052

EP type number Governor

Governor design. : RSV450...1050POA465

: 9 420 234 180 Governer no.

Customer-spec. information Customer : JOHN DEERE

Engine : 6619A

1st version kW : 201.0 : 2100 Rated speed

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x3.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.75...2.85 : (2.70...2.90)

Rack travel in mm: 10.50

: 1-5-3-6-2-4 Firing order

Phasina : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 1

#### BASIC SETTING

1st speed rpm: 1050

Rack travel in mm : 12.40...12.50

Del.quantity cm3/: 17.4...17.6

100 s: (17.1...17.9)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 450.0 2nd speed Rack travel in mm: 6.0...6.2 Del.quantity cm3/: 1.9...2.5 100 s: (1.7...2.7)

Spread

cm3 : 0.4 100 s: (0.7)

# GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050 Speed Aneroid pressure h: 900

Del.quantity : 174.0...176.0 1000 : (171.0...179.0)

Spread cm3 : 4.00

1000 : (7.50)

# RATED SPEED

1st version Control lever

position degrees: 47...55

Testing:

1st rack travel in: 11.40

rpm : 1090...1100 Speed

2nd rack travel in: 4.00

C13

rpm : 1220...1250 Speed 4th rack travel in: 1250 Speed : 0.30...1.40 rom

LOW IDLE 1 Control Lever

position degrees: 25...33 Setting point w/out bumper spring

Speed rpm : 450 Rack travel in mm : 5.6

Testina:

Speed rpm : 100 Minimum rack trave: 19.00 rpm : 450

Rack travel in mm : 6.00...6.20 Rack travel in mm : 2.00

: 600...660 Speed rom .

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1050

Rack travel in m: 12.40...12.50

2nd speed rpm : 650

Rack travel in m: 13.60...13.80

Aneroid/Altitude Compensator Test

1st version Settina

Speed : 500 rom hPa : 900 Pressure

: 13.60...13.80 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.50...10.70

2nd pressure hPa : 280

Rack travel in m: 11.70...11.80

3rd pressure hPa : 480

Rack travel in m: 12.80...13.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900 rpm : 650

Del.quantity cm3/: 198.5...201.5

1000 s: (195.0...205.0)

Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: -1000 s: (123.0...133.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.40

Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 170.0...210.0 1000 s: (165.0...215.0) Rack travel in mm: 20.00...21.00

HIGH IDLE

1st version

Speed : 1170 rpm

Rack travel in mm : 7.40...7.60

LOW IDLE

Speed rpm : 450 Rack travel in mm : 6.00...6.20 Del.quantity cm3/: 19.0...25.0 1000 s: (17.0...27.0)

Spread cm3 : 4.501000 s: (7.50)

Remarks:

: JOHN DEERE # RE29146

Starting/full-load transition speed from holding magnet = 400 1/min.

Start-of-delivery mark at control-rod travel 10.5 mm and 15° after start of delivery.

Screw in torque-control-spring retainer to make contact at 650 L/min.

#### Note remarks

Test sheet : DEE 7,6 g 3 Edition : 20.12.88 Replaces : 11.85 Test oil : ISO-4113

Combination no. : 9 400 231 084

Injection pump

Pump designation : PES6P110A720RS3083-1 : 9 410 231 027 EP type number

Governor

Governor design. : RSV425...1100P2A489

: 9 420 234 138 Governer no.

Customer-spec. information Customer : JOHN DEERE

Engine : 6466 A

1st version kW : 161.0 Rated speed : 2200

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 456 413 010

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00X3.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 3.45...3.55

: (3.40...3.60)

Rack travel in mm: 10.50

Firing order : 1-5-3-6-2-4

Phasina : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

#### BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 12.00...12.10

Del.quantity cm3/: 13.7...13.9

100 s: (13.4...14.2)

cm3 : 0.4Spread

100 s: (0.7)

rpm : 425.0 2nd speed

Rack travel in mm: 6.4...6.6 Del.quantity cm3/: 1.0...1.5

100 s: (0.8...1.8)

cm3 : 0.4 100 s: (0.7) Spread

#### GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed Aneroid pressure h: 900

: 137.5...139.5 Del.quantity

1000 : (134.5...142.5)

: 4.00 Spread cm3

1000 : (7.50)

#### RATED SPEED

1st version Control lever

position degrees: 46...54

Testing:

1st rack travel in: 11.00 Speed rpm : 1155...1165 2nd rack travel in: 4.00

**C15** 

Speed rpm : 1230...1260 3rd rack travel in: 4.00

4th rack travel in: 1350

Speed rpm : 0.30...1.40

LOW IDLE 1 Control lever

position degrees: 21...29 Setting point w/out bumper spring

Speed rpm : 425 Rack travel in mm : 6.0

Testing:

Speed rpm : 100 Minimum rack trave: 19.00 Speed rpm : 425

Rack travel in mm : 6.40...6.60

Rack travel in mm: 2.00

Speed : 655...715 COM

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 12.00...12.10

2nd speed rpm : 700

Rack travel in m: 13.10...13.30

Aneroid/Altitude Compensator Test

1st version

Setting Speed rpm

: 500 hPa : -Pressure

: 11.10...11.30 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : 200 Rack travel in m: 11.40...11.80

2nd pressure hPa : 375 Rack travel in m: 12.50...12.60

3rd pressure hPa : 900

Rack travel in m: 13.10...13.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 700 Del.quantity cm3/: 155.5...159.5 1000 s: (152.5...162.5)

Aneroid pressure h: rpm : 500 Speed

Del.quantity cm3/: -1000 s: (102.0...112.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.00

rpm : 1155...1165 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 150.0...170.0 1000 s: (145.0...175.0)

Rack travel in mm : 20.00...21.00

HIGH IDLE

1st version

Speed rpm : 1200 Rack travel in mm : 7.30...7.50

LOW IDLE

Speed rpm : 425 Rack travel in mm : 6.40...6.60 Del.quantity cm3/: 10.5...15.5 1000 s: (8.0...18.0)

Spread cm3 : 4.50 1000 s: (7.50)

Remarks:

: JOHN DEERE # RE23748

Adjustment without torque-control spring retainer with 1 mm Less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Starting/full-load transition speed from holding magnet = 400 1/min.

Start-of-delivery mark 13° cam angle after start of delivery cyl. 1.

Note remarks

Test sheet : IHC 9,4 a 7 : 6.3.89 Edition

Replaces

Test oil : ISO-4113

Combination no. : 9 400 231 115

Injection pump

Pump designation : PES8P100A921/5RS286

Governor

Governor design. : RQV350...1200PA643-1

Customer-spec. information Customer : IHC

Engine : DVT 800

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 040

Inlet press., bar: 2.80

Test nozzle holder

assembly : 1 688 901 017

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,7

Test lines : 9 681 230 713

Outside diameter x Wall thickness

x Length mm : 6,35x1,57x1025,4

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Prestroke mm : 2.70...2.80 : (2.65...2.85)

Rack travel in mm: 9.50

: 1-8-4-2-7-3-6-5 Firing order

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rom: 1200

Rack travel in mm : 9.50...9.60

Del.quantity cm3/: 10.5...10.7

100 s: (-)

Spread cm3 : 0.4

100 s: (-)

rpm : 350 2nd speed

Rack travel in mm : 4.90...5.10

Del.quantity cm3/: 1.9...2.3

100 s: (-)

Spread cm3 : 0.5

100 s: (-)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1200 Speed Aneroid pressure h: 930 Aneroid F. Del.quantity : 10-1000 : (-)

: 105.5...107.5

RATED SPEED

1st version Control Lever

position degrees: 59.5...64.5

Testing:

1st rack travel in: 8.50

Speed rpm: 1240...1250 2nd rack travel in: 4.00

Speed rom: 1390...1330 4th rack travel in: 1370

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 10.5...15.5 Setting point w/out bumper spring

Speed rpm : 350 Rack travel in mm : 5.0 : 350 Speed

rpm Rack travel in mm : 4.80...5.20 Rack travel in mm : 2.00

: 650...710 Speed rpm Speed rpm : 285 Maximum rack trave: 7.00 CONSTANT REGULATION Speed rpm : 400...460 TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 1200
Rack travel in m: 9.50...9.60
2nd speed rpm : 900
Rack travel in m: 10.75...10.85 Aneroid/Altitude Compensator Test 1st version Setting Speed Pressure hPa : 160 \* FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 930 : 900 Speed rpm Del.quantity cm3/: 117.0...123.0 1000 s: (-) Spread cm3 : 4.01000 s: (-) Aneroid pressure h: -Speed rpm: 800 Del.quantity cm3/: 82.0...90.0 1000 s: (-) Spread cm3 : 4.01000 s: (-) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 8.50 Speed rpm : 1240...1250 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 199.0...239.0 1000 s: (-)

rpm : 350

LOW IDLE

Speed

**C18** 

Rack travel in mm : 19.0...23.0 Del.quantity cm3/ : (-)

#### Remarks:

\* Start of LDA (manifold-pressure compensator) movement

#### APPLICATION

Tractor (tractor engines)

# BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

: DEE 7,6 g 4 : 20.12.88 Test sheet Edition Replaces : 17.10.88 Test oil : ISO-4113

Combination no. : 9 400 231 196

Injection pump

Pump designation : PES6P110A720RS3083 EP type number : 9 410 231 009

Governor

: RSV400...1050P2A488-Governor design.

: 9 420 234 130 Governer no.

Customer-spec. information Customer : JOHN DEERE

Engine : 6466 AF

1st version kW : 167.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x3.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY Test pressure, bar: 27...29

Prestroke mm : 3.45...3.55

: (3.40...3.60)

Rack travel in mm: 10.50

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1050

Rack travel in mm : 12.60...12.70

Del.quantity cm3/: 14.9...15.1

100 s: (14.7...15.4)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 400.0 Rack travel in mm : 6.6...6.8 Del.quantity cm3/ : 1.3...1.8 100 s: (1.1...2.1)

cm3 : 0.4 100 s: (0.7) Spread

GUIDE SLEEVE POSITION Control-lever position Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050 Aneroid pressure h: 1200

Del.quantity : 149.5...(514.0)

: 4.00 cm3 : (7.50) 1000

RATED SPEED

1st version Control lever

position degrees: 42...50

Testing:

1st rack travel in: 11.60 Speed rpm : 1095...1105

**C19** 

2nd rack travel in: 4.00 rpm : 1190...1200 Speed 3rd rack travel in: 4.00 rpm : 1195...1225 Speed 4th rack travel in: 1300 Speed rpm : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 19...27 Setting point w/out bumper spring rpm : 400 Rack travel in mm: 6.2 Testing: Speed rpm : 100 Minimum rack trave: 19.00 rpm : 400 Rack travel in mm : 6.60...6.80 Rack travel in mm : 2.00 Speed : 660...720 rpm

TORQUE CONTROL Dimension a mm :?

Torque control curve - 1st version

1st speed rpm : 1050

Rack travel in m: 12.60...12.70

2nd speed rpm : 700

Rack travel in m: 13.80...14.00

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 500 rpm Pressure hPa : 1200

: 13.80...14.00 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.30...10.50

2nd pressure hPa : 665

Rack travel in m: 12.90...13.00

3rd pressure hPa : 415

Rack travel in m: 11.20...11.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 700 Del.quantity cm3/ : 180.0...185.0 1000 s: (177.5...187.5)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 91.0...95.0 1000 s: (88.0...98.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.60

Speed rpm : 1095...1105

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 156.0...176.0 1000 s: (152.0...180.0) Rack travel in mm: 19.00...21.00

LOW IDLE

Speed rpm : 400 Rack travel in mm : 6.60...6.80 Del.quantity cm3/: 13.5...18.5 1000 s: (11.0...21.0)

Spread cm3 : 4.50

1000 s: (7.50)

Remarks:

: JOHN DEERE # RE25013

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Start-of-delivery mark = 12,75° after start of delivery cyl. 1.

Starting/full-load transition speed from holding magnet = 400 1/min.

#### Note remarks

Test sheet : DEE 10, 1a12 Edition : 20.12.88

Replaces

Test oil : ISO-4113

Combination no. : 9 400 231 214

Injection pump

Pump designation : PES6P110A720RS370 EP type number : 0 412 016 052

Governor

Governor design. : RSV500...900P0/452-1

: 9 420 234 123 Governer no.

Customer-spec. information Customer : JOHN DEERE

Engine : 6619 A

1st version kW : 164.0 Rated speed : 1800

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Open ind

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x3.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 27...29

Prestroke mm : 2.75...2.85

: (2.70...2.90)

Rack travel in mm: 10.50

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 900 1st speed

Rack travel in mm : 11.60...11.70

Del.quantity cm3/: 16.0...16.2

100 s: (15.7...16.4)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 500.02nd speed Rack travel in mm : 5.9...6.1 Del.quantity cm3/ : 1.9...2.5 100 s: (1.6...2.7)

Spread cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900 Aneroid pressure h: 900

Del.quantity : 160.0...162.0 1000 : (157.5...164.5)

Spread

cm3 : 4.00 1000 : (7.50)

RATED SPEED

1st version Control Lever

position degrees: 38...46

Testing:

1st rack travel in: 10.60 rpm : 945...955 Speed

3rd rack travel in: 6.20

C21

rpm : 985...1015 Speed 4th rack travel in: 1100

rom : 0.30...1.70Speed

LOW IDLE 1 Control lever

position degrees: 21...29 Setting point w/out bumper spring

Speed rpm : 500 Rack travel in mm : 5.5

Testing:

Speed rpm : 100 Minimum rack trave: 19.00 : 500 rom

Rack travel in mm : 5.90...6.10

Rack travel in mm: 2.00

Speed rpm : 610...670

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 900

Rack travel in m: 11.60...11.70

2nd speed rpm : 650

Rack travel in m: 12.40...12.60

Aneroid/Altitude Compensator Test

1st version Setting

rpm : 550 hPa : 900 Speed Pressure

Rack travel mm : 12.40...12.60

Measurement

Speed 1/min: 550

1st pressure hPa : -

Rack travel in m: 10.90...11.10

2nd pressure hPa : 420

Rack travel in m: 11.40...11.50 3rd pressure hPa : 575 Rack travel in m: 12.30...12.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 650 Del.quantity cm3/ : 176.5...179.5 1000 s: (174.0...182.0)

Aneroid pressure h: -

Speed rpm : 550 Del.quantity cm3/ : 143.0...147.0

1000 s: (140.0...150.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.60 Speed rpm : 945...955 Speed

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 190.0...210.0 1000 s: (185.0...215.0)

Rack travel in mm : 19.00...21.00

HIGH IDLE

1st version

rpm : 1000 Speed

Rack travel in mm : 6.10...6.30 Del.quantity cm3/: 23.5...28.5

1000 s: (21.0...31.0)

LOW IDLE

Speed rpm : 500 Rack travel in mm : 5.90...6.10 Del.quantity cm3/ : 19.0...25.0 1000 s: (16.5...27.5)

cm3 : 4.50 Spread

1000 s: (7.50)

Remarks:

: JOHN DEERE # RE21153

Start-of-delivery mark at control-rod travel 10.5 mm and 15° after start of

delivery.

Screw in torque-control-spring

retainer to make contact at 650 L/min.

Note inst. in remarks column

: ONA 3,4 C1 Test sheet Edition : 03.02.89

replaces

Calibrating oil : ISO 4113

Injection pump : VE 6/10F1500 R209-3

Type number : 0 460 406 062

Customer-specific information

Customer

: ONAN

Engine

: L634TA HD

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

assembly : 1 688 901 000

Opening

bar: 147...150 pressure

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 x Length mm: 840

Start of delivery

Prestroke

e mm: 0.2 (from BDC): +0.02(0.04)

Injection pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500 Charge press. hPa: 800 Setting value

mm: 3.8...4.2

Supply-pump pressure:

Speed 1/min: 1500 Charge press. hPa: 800

Setting value bar: 5.1...5.7

Full-load del. with charge press.:

Speed 1/min: 1400 Charge press. hPa: 800

Del.quantity cm3/ 1000H.: 56.5...57.5 Dispersion cm3/: 3.0 1000H: -

Full-load del. W/out charge press.:

1/min: 700

Del.quantity cm3/ 1000H.: 39.5...40.5

Low-idle speed regulation:

1/min: 400 Speed Charge press. hPa: -

Del.quantity cm3/ 1000H.: 13.0...17.0

cm3/: 3.0 Dispersion 1000H .: -

Full-load speed regulation:

Speed 1/min: 1640 Charge press. hPa: 800

Del.quantity cm3/ 1000H: 10.0...14.0

Start:

Speed 1/min: 100 Del.quantity cm3/1000H.: 37.0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800 Charge press. hPa: 800

TD travel mm: 0.9...1.7 mm: (0.6...2.0)

2nd speed 1/min: 1100 Charge press. hPa: 800

mm: 2.2...2.8 mm: (1.8...3.2) TD travel

1/min: 1500 3rd speed Charge press. hPa: 800

TD travel mm: 3.8...4.2 mm: (3.3...4.7)

Supply-pump pressure characteristic:

1st speed 1/min: 700 Charge press. hPa: 800

Supply-pump	+
pressure bar: 2.32.9	+ Mech. shutoff:
2nd speed 1/min: 1100	+
Charge press. hPa: 800	+ Speed 1/min: 1500
Supply-pump	+ Del.quantity cm3/: 03
pressure bar: 3.84.4	1000H.: -
3rd speed 1/min: 1500	+
Charge press. hPa: 800	+ Electr. shutoff:
Supply-pump	+
pressure bar: 5.15.7	+ Speed 1/min: 350
Our method and the second of	+ ELAB volt: -
Overflow quantity at overflow valve:	+ Del.quantity cm3/: 0.03.0
Ach anad Amin. 700	max. 1000H.: -
1st speed 1/min: 700	<b>T</b>
Charge press. hPa: 800	† Idle delivery:
Oveflow : 4183	† 4.1. 750
quantity cm3/10s: (2698)	+ 1st speed 1/min: 350
2nd speed 1/min: 1500	Del.quantity cm3/: 26.533.5
Charge press. hPa: 800	1000H.: -
Overflow : 55138	+ 2nd speed 1/min: 400
quantity cm3/10s: (40153)	Del.quantity cm3/: 13.017.0 1000H.: (11.018.0)
Dolfvers conjugate and brooks up about	† 7000H.: (11,018,0)
Delivery quant. and breakaway char.:	+ 3rd speed 1/min: 450
Act aread Alvin 700	+ Del.quantity cm3/: 0,06,0
1st speed 1/min: 700	1000H.: -
Charge-air pressure-setting	† A
point hPa: 400	+ Automatic starting fuel delivery:
LDA stroke mm: 6,5 Del.quantity cm3/: 47.548.5	1 44 1 4/1 200
1000u . (/5 7 50 7)	1st speed 1/min: 220
1000H.: (45,750,3)	Del.quantity cm3/: -
2nd speed 1/min: 1700	ind. 1000H: 37.0
Charge press. hPa: 800	T 2nd mand 4/min 700
Del.quantity cm3/: 0.06.0 1000H.: -	+ 2nd speed 1/min: 300
3rd speed 1/min: 1640	+ Del.quantity cm3/: -
Charge press. hPa: 800	max. 1000H: 37.0
Del.quantity cm3/: 10.014.0	T Churche alachumum at
10004 - (9.0 14.0)	+ Shutoff electromagnet:
1000H.: (8.016.0) 4th speed 1/min: 1580	Ť () :
Charge press. hPa: 800	+ Cut-in
Del.quantity cm3/: 33.041.0	+ min. voltage : 10.0
1000H.: -	+ Rated voltage : 12.0
5th speed 1/min: 1500	Mounting and appenhing dimensions.
Charge press. hPa: 800	Mounting and assembly dimensions:
Del.quantity cm3/: 53.056.0	I Posignation
1000H.: (52.256.8)	+ Designation + K mm : -
6th speed 1/min: 1400	+ KF mm :6.0
Charge press. hPa: 800	+ KF mm : 5.66.0 + MS mm : 0.61.0
Del.quantity cm3/: 56.557.5	+ MS mm : 0.61.0 + SVS max. mm : 1.9
1000H.: (54.759.3)	Designation
7th speed 1/min: 700	XL mm : 12,415,8
Charge press. hPa: 800	1 12/4 12/9
Del.quantity cm3/: 56.059.0	Remarks:
1000H.: -	Tollier 193 .
8th speed 1/min: 700	1
Charge press. hPa: -	1
Del.quantity cm3/: 39.540.5	1
1000H: (37.742.3)	1
। जन्म साम् । यो वा वा विकास कार	1
Zero delivery (stop):	+
The state of the s	t control of the cont

Note inst. in remarks column

Test sheet : CAS 3,9L : 31.01.89 Edition

replaces

Calibrating oil : ISO 4113

Injection pump : VE 4/12F1100 R310-1

: 0 460 424 043 Type number

Customer-specific information

Customer : CASE

: 4BT -3.9 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer: 40...48 electronically : 42...50

Inlet press., bar: 0,35

Calibrating nozzle-holder

assembly : 1 688 901 027

**Opening** 

bar: 250...253 pressure

Perforated plate

mm: 0.5 diameter

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm : 840 x Length

Start of delivery

Prestroke

te mm: 0,3 (from BDC): +0,02(0,04)

Start of delivery block Piston stroke mm: 1,55 mm: +0,02(0,06)

Outlet

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750 Charge press. hPa: 1000 Setting value mm: 3,3...3,7

Supply-pump pressure:

1/min: 750 Speed Charge press. hPa: 1000 Setting value bar: 4,5...5,1

Full-load del. with charge press.:

Speed 1/min: 750 Charge press. hPa: 1000

Del.quantity cm3/ 1000H.: 82,5...83,5

cm3/:4,0Dispersion 1000H: (4,5)

Full-load del. w/out charge press.:

1/min : 500 Speed

Del.quantity cm3/ 1000H.: 49,5...50,5

Low-idle speed regulation:

1/min: 400 Speed Charge press. hPa: -Del.quantity cm3/

1000H.: 8,5...14,5 cm3/: 5,5 1000H.: (7,0)

Dispersion

Full-load speed regulation:

Speed 1/min: 1170 Charge press. hPa: 1000

Del.quantity cm3/ 1000H: 52,0...58,0

Start:

1/min: 100 Speed Del.quantity mind cm3/1000H.: 45.0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500 Charge press. hPa: 1000

mm: 1,6...2,4 mm: (1,3...2,7) TD travel

2nd speed 1/min: 750 Charge press. hPa: 1000 TD travel mm: 3,3...3,7 mm: (2,8...4,2)
3rd speed 1/min: 1100

C25

Charge press. hPa: 1000 TD travel mm: 4,55,3 mm: (4,25,6) Supply-pump pressure characteristic:	Del.quantity cm3/: 74,079,0 1000H.: (72,580,5) 8th speed 1/min: 750 Charge press. hPa: 1000 Del.quantity cm3/: 82,583,5
1st speed 1/min: 500 Charge press. hPa: 1000 Supply-pump pressure bar: 3,44,0 2nd speed 1/min: 750 Charge press. hPa: 1000 Supply-pump pressure bar: 4,55,1 3rd speed 1/min: 1100 Charge press. hPa: 1000	1000H: (80,086,0)  9th speed 1/min: 500  Charge press. hPa: 1000  Del.quantity cm3/: 85,093,0  1000H: -  10th speed 1/min: 500  Charge press. hPa: -  Del.quantity cm3/: 49,550,5  1000H: (46,054,0)  Zero delivery (stop):
Supply-pump pressure bar: 5,96,5	Mech. shutoff:
Overflow quantity at overflow valve:  1st speed  1/min: 500	Speed 1/min: 1100 Del.quantity cm3/: 03 1000H.: -
Charge press. hPa: -  Oveflow: 4183  quantity cm3/10s: (2698)  2nd speed: 1/min: 1100	Electr. shutoff: Speed 1/min: 400
Charge press. hPa: 1000 Overflow: 55138 quantity cm3/10s: (40153)	ELAB volt: -  Del.quantity cm3/: 0,03,0  max. 1000H.: -
Delivery-quant. and breakaway char.:	Idle delivery:
1st speed 1/min: 650 Charge-air pressure-setting point hPa: 325 LDA stroke mm: 5,0 Del.quantity cm3/: 72,073,0 1000H.: (68,576,5) 2nd speed 1/min: 1300 Charge press. hPa: 1000 Del.quantity cm3/: 0,03,0 1000H.: -	1st speed 1/min: 375 Del.quantity cm3/: 33,541,5 1000H.: - 2nd speed 1/min: 400 Del.quantity cm3/: 8,514,5 1000H.: (6,516,5) 3rd speed 1/min: 550 Del.quantity cm3/: 0,04,0 1000H.: -
3rd speed 1/min: 1250 Charge press. hPa: 1000 Del.quantity cm3/: 0,015,0 1000H.: - 4th speed 1/min: 1200 Charge press. hPa: 1000 Del.quantity cm3/: 15,055,0 1000H.: - 5th speed 1/min: 1170 Charge press. hPa: 1000 Del.quantity cm3/: 52,058,0 1000H.: (49,061,0) 6th speed 1/min: 1100 Charge press. hPa: 1000 Del.quantity cm3/: 67,069,0 1000H.: (65,571,5) 7th speed 1/min: 900 Charge press. hPa: 1000	Automatic starting fuel delivery:  1st speed 1/min: 250 Charge press. hPa: - Del.quantity cm3/: - ind. 1000H: 75,0  2nd speed 1/min: 400 Charge press. hPa: - Del.quantity cm3/: - max. 1000H: 75,0  Shutoff electromagnet:  Cut-in min. voltage : 10,0 Rated voltage : 12,0

# Mounting and assembly dimensions:

Designation K KF MS SVS max. XK XL : -: 5,0...5,4 : 0,8...1,2 : 1,3 : 18,1...20,8 : 9,9...13,3 mm mm mn mm mm

Remarks:

Note inst. in remarks column

: CUM 3,9 N11 Test sheet Edition : 02.02.89

replaces

Calibrating oil : ISO 4113

: VE 4/12F1050 R226-10 Injection pump

: 0 460 424 053 Type number

Customer-specific information

Customer

Engine

: 4 BT 390 IND

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

assembly : 1 688 901 027

Opening |

bar: 250...253 pressure

Perforated plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Start of delivery

Prestroke mm : 0.3(from BDC): +-0.02

Start of delivery block Piston stroke mm: 1.8

mm: +0.02(0.06)

Outlet

Injection-pump setting values Test specifications in parentheses

Timing device travel:

Speed 1/min: 900

Setting value mm: 2.3...2.7

Supply-pump pressure:

1/min: 900 Speed Setting value bar: 4.1...4.7

Full-load del. W/out charge press.:

1/min: 900 Speed

Del.quantity cm3/ 1000H.: 69.0...70.0

cm3/: 4.0 Dispersion 1000H.: (4.5)

Low-idle speed regulation:

1/min: 375 Speed

Del.quantity cm3/ 1000H.: 10.0...12.0 Dispersion cm3/: 5.5

1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1110

Del.quantity cm3/ 1000H: 49.0...55.0

Start:

Speed 1/min: 100 Del.quantity

mind cm3/1000H.: 70.0

Inspection pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750

mm: 1.3...2.1 mm: (1.0...2.4) TD travel

1/min: 900 2nd speed

TD travel mm: 2.3...2.7

mm: (1.8...3.2) 3rd speed 1/min: 1050

mm: 2.8...3.6 mm: (2.5...3.9) TD travel

Supply-pump pressure characteristic:

1st speed 1/min: 500

Supply-pump

bar: 2.3...2.9 pressure

1/min: 900 2nd speed

Supply-pump pressure

bar: 4.1...4.7

3rd speed 1/min: 1050

**C28** 

Supply-pump bar: 4.8...5.4 pressure Overflow quantity at overflow valve: 1st speed 1/min: 500 Oveflow : 41...83 quantity cm3/10s: (26...98) 1/min: 1050 2nd speed : 55...138 Overflow quantity cm3/10s: (40...153) Delivery-quant, and breakaway char.: 1st speed 1/min: 1200 Del.quantity cm3/: 0.0...3.0 1000H.: -1/min: 1180 2nd speed Del.quantity cm3/: 0.0...15.0 1000H.: -1/min: 1140 3rd speed Del.quantity cm3/: 15.0...55.0 1000H.: -4th speed 1/min: 1110 Del.quantity cm3/: 49.0...55.0 1000H.: (46.0...58.0) 5th speed 1/min: 1050 Del.quantity cm3/: 66.0...69.0 1000H.: (64.5...70.5) 1/min: 900 6th speed Del.quantity cm3/: 69.0...70.0 1000H.: (66.5...72.5) 7th speed 1/min: 750 Del.quantity cm3/: 72.0...76.0 1000H.: (70.0...78.0) 8th speed 1/min: 500 Del.quantity cm3/: 72.0...80.0 1000H: (70.0...82.0) Zero delivery (stop): Mech. shutoff: Speed 1/min: 1050 Del.quantity cm3/: 0..3 1000H.: -Electr. shutoff: 1/min: 375 Speed ELAB volt: -Del.quantity cm3/: 0.0...3.0 max. 1000H.: -Idle delivery: 1/min: 375 1st speed Del.quantity cm3/: 10.0..12.0 1000H.: (6.0...16.0)

1/min: 500

Del.quantity cm3/: 0.0...4.0 1000H.: -Automatic starting fuel delivery: 1/min: 130 1st speed Del.quantity cm3/: -1000H: 80.0 ind. 2nd speed 1/min: 240 Del.quantity cm3/: -max. 1000H: 80.0 Shutoff electromagnet: Cut-in min. voltage : 10.0 Rated voltage : 12.0 Mounting and assembly dimensions: Designation K mm KF : 5.0...5.4 mm MS : 1.1...1.5 mm SVS max. mm : -XK mm : -XL mm : -Remarks:

2nd speed

Note inst. in remarks column

: STE 6,5K4 Test sheet Edition : 10.03.89

replaces

Calibrating oil : ISO 4113

Injection pump : VE 6/12F1200 R235 : 0 460 426 079 Type number

Customer Part-No. :

Customer-specific information Customer : STEYR

: WD 612-04 Engine

Power k: 100

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer: 40...48 : 42...50 electronically

Inlet press., bar: 0,35

Calibrating nozzle-holder

assembly : 1 688 901 020

**Opening** 

pressure bar: 172...175

Perforated-plate

diameter mm: 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm : 840 x Length

Start of delivery Prestroke mm : -(from BDC): -

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1100 Setting value mm: 2,2...2,6 Supply-pump pressure:

1/min: 1100 Speed Setting value bar: 6,1...6,7

Full-load del. w/out charge press.:

1/min: 1000 Speed

Del.quantity cm3/ 1000H.: 95,0...96,0 Dispersion cm3/: 3,5 1000H .: -

Low-idle speed regulation:

1/min: 325 Speed

Del.quantity cm3/ 1000H.: 18,0...22,0 Dispersion cm3/: 3,5

1000H.: (4,5)

Full-load speed regulation:

1/min: 1250 Speed

Del.quantity cm3/

1000H: 61,0...67,0

Start:

Speed 1/min: 100 Del.quantity cm3/1000H.: 90,0 mind

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 900

mm: 0,8...1,4 mm: (0,4...1,8) TD travel

1/min: 1100 2nd speed

mm: 2,2...2,6 mm: (1,7...3,1) TD travel

3rd speed 1/min: 1200

TD travel

mm: 2,7...3,3 mm: (2,3...3,7)

Supply-pump pressure characteristic:

1st speed 1/min: 500

Supply-pump

bar: 3,5...4,1 1/min: 1100 pressure 2nd speed

Supply-pump

pressure bar: 6,1...6,7 3rd speed 1/min: 1200

Supply-pump

pressure bar: 6,6...7,2

Overflow quantity at overflow valve:
1st speed 1/min: 500 Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1200 Overflow : 55138 quantity cm3/10s: (40153)
Delivery-quant. and breakaway char.:
1st speed 1/min: 1350  Del.quantity cm3/: 0,03,0  1000H.: -  2nd speed 1/min: 1300  Del.quantity cm3/: 26,034,0  1000H.: (25,035,0)  3rd speed 1/min: 1250  Del.quantity cm3/: 61,067,0  1000H.: (59,069,0)  4th speed 1/min: 1200  Del.quantity cm3/: 90,593,5  1000H.: (89,095,0)  5th speed 1/min: 1000  Del.quantity cm3/: 95,096,0  1000H.: (92,598,5)  6th speed 1/min: 700  Del.quantity cm3/: 88,891,2  1000H.: (86,393,7)  7th speed 1/min: 500
7th speed 1/min: 500 Del.quantity cm3/: 82,585,5 1000H.: (80,387,7)
Zero delivery (stop):
Mech. shutoff:
Speed 1/min: 1200 Del.quantity cm3/: - 1000H.: -
Idle delivery:
1st speed 1/min: 325 Del.quantity cm3/: 18,022,0 1000H.: (15,025,0)
2nd speed 1/min: 370 Del.quantity cm3/: 1,07,0 1000H.: (0,09,0)
3rd speed 1/min: 400 Del.quantity cm3/: 0,03,0 1000H.: -
Automatic starting fuel delivery:
1st speed 1/min: 170 Del.quantity cm3/: - ind. 1000H: 90,0

2nd speed 1/min: 350
Del.quantity cm3/: max. 1000H: 82,0

3rd speed 1/min: 250
Del.quantity cm3/: 1000H: 
Mounting and assembly dimensions:

Designation K mm: KF mm: 5,6...6,0
SVS max. mm: 4,0

Remarks:

Note inst. in remarks column

Test sheet : PER 6,0 C Edition : 03.02.89 : 29.07.87 replaces Calibrating oil : ISO 4113

: VE 6/12F1300 R240 : 0 460 426 084 Injection pump Type number

Customer-specific information Customer : PERKINS

Engine : T6 60 CC TRU

TEST BENCH REQUIREMENTS

Calibrating oil return temp.

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

assembly : 1 688 901 020

Opening |

bar: 172...175 pressure

Perforated plate

diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Start of delivery

mm: 0.25 Prestroke

(from BDC): +0.02(0.04)

Start of delivery block Piston stroke mm: 1.0 mm: +-0.02

Outlet

Injection-pump setting values Test specifications in parentheses

Timing device travel:

Speed 1/min: 1100 Charge press. hPa: 1000 Setting value mm: 1.3...1.7

Supply-pump pressure:

Speed 1/min: 1100 Charge press. hPa: 1000 Setting value bar: 6.5...7.1

Full-load del. with charge press.:

Speed 1/min: 700 Charge press. hPa: 1000

Del.quantity cm3/ 1000H.: 99.0...100.0

cm3/:5.0Dispersion 1000H: -

Full-load del. w/out charge press.:

1/min: 700 Speed

Del.quantity cm3/ 1000H.: 87.0...88.0

Low-idle speed regulation:

1/min: 300 Speed Charge press. hPa: -Del.quantity cm3/ 1000H.: 16.5...20.5 Dispersion cm3/: 5.0

Dispersion 1000H.: -

Full-load speed regulation:

Speed 1/min: 1450 Charge press. hPa: 1000 Del.quantity cm3/ 1000H: 47.0...53.0

Start:

Speed 1/min: 100 Charge press. hPa: -Del.quantity cm3/1000H.: 120.0 mind

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000 Charge press. hPa: 1000

TD travel mm: 0.4...1.2 mm: (0.1...1.5)

2nd speed 1/min: 1100 Charge press. hPa: 1000

mm: 1.3...1.7 mm: (0.8...2.2) TD travel

DO4

Charge press. hPa: 1000	T unarge press. nra: 1000
TD travel mm: 2.02.8	Del.quantity cm3/: 99.0100.0 1000H.: (96.5102.5)
mm: (1.73,1)	8th speed 1/min: 700
114117 (1.11.17)	Charge press. hPa: -
Supply-pump pressure characteristic:	Del.quantity cm3/: 87.088.0
outpey pump pressure character istre.	1000H: (84.590.5)
1st speed 1/min: 500	9th speed 1/min: 500
Charge press. hPa: 1000	
Supply-pump	the Charge press. hPa: - Del.quantity cm3/: 80.083.0
pressure bar: 3.94.5	1000H: (78.584.5)
2nd speed 1/min: 1100	T 1000n: (70.504.5)
Charge press. hPa: 1000	T Your doldsom (oten)
Supply-pump	† Zero delivery (stop):
pressure bar: 6.57.1	Mach shutaff.
3rd speed 1/min: 1300	+ Mech. shutoff:
Charge press. hPa: 1000	T Speed 1/min 1700
	+ Speed 1/min: 1300
Supply-pump pressure bar: 7.37.9	bel.quantity cm3/: 03
pressure part 7.57.9	1000н.: -
Conflor manifold of acoustics	The standard of the standard o
Overflow quantity at overflow valve:	+ Electr. shutoff:
1st speed 1/min: 500	Chand A/min 200
	+ Speed 1/min: 300
Charge press. hPa: -	+ ELAB volt: -
Oveflow : 4183	Del.quantity cm3/: 0.03.0
quantity cm3/10s: (2698)	+ max. 1000H.:-
2nd speed 1/min: 1300	T-11 - 1-1 - 1-1
Charge press. hPa: 1000	+ Idle delivery:
Overflow : 55138	1
quantity cm3/10s: (40153)	1st speed 1/min: 300
Online and the state of the	+ Del.quantity cm3/: 16.520.5
Delivery-quant. and breakaway char.:	+ 1000H.: (13.523.5)
A-1	+ 2nd speed 1/min: 350
1st speed 1/min: 700	Del.quantity cm3/: 4.510.5 1000H.: (2.512.5)
Charge-air pressure-setting	† _ 1000H.: (2.512.5)
point hPa: 450	+ 3rd speed 1/min: 400
LDA stroke mm: 6.3	+ Del.quantity cm3/: 0.02.6
Del.quantity cm3/: 95.096.0	† 1000H.: -
1000H.: (92.598.5)	†
2nd speed 1/min: 1550	+ Automatic starting fuel delivery:
Charge press. hPa: 1000	
Del.quantity cm3/: 0.07.0	+ 1st speed 1/min: 150
1000H.: -	+ Charge press. hPa: -
3rd speed 1/min: 1500	- Del.quantity cm3/: -
Charge press. hPa: 1000	+ ind. 1000H: 95.0
Del.quantity cm3/: 13.521.5	† • • • • • • • • • • • • • • • • • • •
1000H.: (10.524.5)	+ 2nd speed 1/min: 230
4th speed 1/min: 1450	- Charge press. hPa: -
Charge press. hPa: 1000	+ Del.quantity cm3/: -
Del.quantity_cm3/: 47.053.0	+ max. 1000H: 85.0
1000H.: (44.056.0)	†
5th speed 1/min: 1300	+ Shutoff electromagnet:
Charge press. hPa: 1000	†
Del.quantity cm3/: 95.098.0	- Cut-in
1000H.: (93.599.5)	min. voltage : 20.0
6th speed 1/min: 1000	Rated voltage : 24.0
Charge press. hPa: 1000	† <b>.</b>
Del.quantity cm3/: 99.5102.5	† Mounting and assembly dimensions:
1000H.: (98.0104.0)	min. Voltage : 20.0 Rated voltage : 24.0  Mounting and assembly dimensions:  Designation
7th speed 1/min: 700	+ Designation
NOC	
005	

K mm : KF mm : K-OT
MS mm : 0.6...1.0
SVS max. mm : 3.2
XK mm : 17.0...19.0
XL mm : 12.8...16.2

Remarks:

Note inst. in remarks column

Test sheet : PER 6.0 C2

Compl. date:

: 03.02.89 Edition : 19.04.88 replaces Calibrating oil : ISO 4113

: VE 6/12F1300 R240-2 Injection pump

Type number : 0 460 426 094

Customer-specific information Customer : PERKINS

Engine

: T6 60 CC TRU

TEST BENCH REQUIREMENTS

Calibrating oil return temp. °C

with thermometer: 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 020 assembly

Opening

bar: 172...175 pressure

Perforated-plate

diameter mm: 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm : 840 x Length

Start of delivery

mm: 0.25 Prestroke

(from BDC): +-0.02(0.04)

Start of delivery block Piston stroke mm: 1.0 mm: +-0.02

Outlet : A

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1100 Speed

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Charge press. hPa: 1000 Setting value mm: 1.3...1.7

Supply-pump pressure:

1/min: 1100 Speed Charge press. hPa: 1000 Setting value bar: 6.5...7.1

Full-load del. with charge press.:

Speed 1/min: 700 Charge press. hPa: 1000 Del.quantity cm3/ 1000H.: 99.0...100.0

cm3/:5.0Dispersion 1000H: -

Full-load del. w/out charge press.:

Speed 1/min: 700

Del.quantity cm3/ 1000H.: 87.0...88.0

Low-idle speed regulation:

Speed 1/min: 300 Charge press. hPa: -Del.quantity cm3/

1000H.: 16.5...20.5

cm3/: 5.0Dispersion 1000H .: -

Full-load speed regulation:

1/min: 1450 Speed Charge press. hPa: 1000

Del.quantity cm3/

1000H: 47.0...53.0

Start:

1/min: 100 Speed Charge press. hPa: -Del.quantity mind cm3/1000H.: 120.0

Inspection\_pump\_test\_specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 1000 1st speed Charge press. hPa: 1000 mm: 0.4...1.2 TD travel mm: (0.1...1.5)

1/min: 1100 2nd speed Charge press. hPa: 1000

TD travel	+ Del.quantity cm3/: 99.5102.5
mm: (0.82.2)	1000H.: (98.0104.0)
3rd speed 1/min: 1300	+ 7th speed 1/min: 700
Charge press. hPa: 1000	+ Charge press, hPa: 1000
TD travel mm: 2.02.8	+ Del.quantity cm3/: 99.0100.0
mm: (1.73.1)	+ 1000H.: (96.5102.5)
	+ 8th speed 1/min: 700
Supply-pump pressure characteristic:	+ Charge press. hPa: -
	- Del.quantity cm3/: 87.088.0
1st speed 1/min: 500	+ 1000H: (84.590.5)
Charge press. hPa: 1000	+ 9th speed 1/min: 500
Supply-pump	+ Charge press. hPa: -
pressure bar: 3.94.5	+ Del.quantity cm3/: 80.083.0
2nd speed 1/min: 1100	1000H: (78.584.5)
Charge press. hPa: 1000	1
Supp (v-pump	Zero delivery (stop):
pressure bar: 6.57.1	1
3rd speed 1/min: 1300	+ Mech. shutoff:
Charge press. hPa: 1000	
Supply-pump	+ Speed 1/min: 1300
pressure bar: 7.37.9	+ Del.quantity cm3/: 03
,	+ 1000H.: -
Overflow quantity at overflow valve:	10001111
	Idle delivery:
1st speed 1/min: 500	+
Charge press. hPa: -	+ 1st speed 1/min: 300
Oveflow : 4183	+ Del.quantity cm3/: 16.520.5
quantity cm3/10s: (2698)	+ Del.quantity cm3/: 16.520.5 + 1000H.: (13.523.5)
2nd speed 1/min: 1300	+ 2nd speed 1/min: 350
Charge press. hPa: 1000	+ Del.quantity cm3/: 4.510.5
Overflow : 55138	Del.quantity cm3/: 4.510.5 1000H.: (2.512.5)
quantity cm3/10s: (40153)	+ 3rd speed 1/min: 400
	+ Del.quantity cm3/: 0.02.6
Delivery-quant. and breakaway char.:	+ 1000H.: -
	+
1st speed 1/min: 700	+ Automatic starting fuel delivery:
Charge-air pressure-setting	+
point hPa: 450	+ 1st speed 1/min: 150
LDA stroke mm: 6.3	+ Charge press. hPa: -
Del.quantity cm3/: 95.096.0	+ Del.quantity cm3/: -
1000H.: (92.598.5)	+ ind. 1000H: 95.0
2nd speed 1/min: 1550	+
Charge press. hPa: 1000	+ 2nd speed 1/min: 230
Del.quantity cm3/: 0.07.0	+ Charge press. hPa: -
1000H.: -	+ Del.quantity cm3/: -
3rd speed 1/min: 1500	+ max. 1000H: 85.0
Charge press. hPa: 1000	+
Del.quantity cm3/: 13.521.5	+ Mounting and assembly dimensions:
1000H.: (10.524.5)	+
4th speed 1/min: 1450	+ Designation
Charge press. hPa: 1000	+ K mm:-
Del.quantity cm3/: 47.053.0	+ KF mm : K-OT
1000H.: (44.056.0)	+ MS mm : 0.61.0
5th speed 1/min: 1300	+ SVS max. mm : -
Charge press. hPa: 1000	+ XK mm : 17.019.0
Del.quantity cm3/: 95.098.0	+ XL mm : 12.816.2
1000H.: (93.599.5)	+
6th speed 1/min: 1000	+ Remarks:
Charge press. hPa: 1000	+
	+

Note inst. in remarks column

: CUM 5,9 U14 Test sheet Edition : 01.02.89

replaces

Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R232-2

Type number : 0 460 426 111

Customer-specific information Customer : CUMMINS

Engine : 6 BT-5.9IND

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

assembly : 1688 901 027

**Opening** 

bar: 250...253 pressure

Perforated plate

diameter mm : 0.5

Test inj. tubing : 1680 750 017

Outside diameter : 6 x Wall thickness : 2 x Length mm: 840

Start of delivery

Prestroke mm : 0.3

(from BDC): +0.02(0.06)

Start of delivery block Piston stroke mm: 1.6

mm: +-0.02(0.06)

Outlet

Injection pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000 Charge press. hPa: 1000

Setting value mm: 1.8...2.2

Supply-pump pressure:

Speed 1/min: 1000 Charge press. hPa: 1000 Setting value bar: 7.4...8.0

Full-load del. with charge press.:

Speed 1/min: 900 Charge press. hPa: 1000 Del.quantity cm3/ 1000H.: 67.5...68.5

Dispersion cm3/:4.01000H: (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 600

Del.quantity cm3/ 1000H.: 56.0...57.0 Dispersion cm3/: 9.0 1000H.: -

Low-idle speed regulation:

Speed 1/min: 340 Charge press. hPa: -Del.quantity cm3/ 1000H.: 10.0...12.0 Dispersion cm3/: 5.5

1000H.: (7.0)

Full-load speed regulation:

1/min: 1170 Charge press. hPa: 1000

Del.quantity cm3/ 1000H: 44.5...50,5

Start:

1/min: 100 Speed Charge press. hPa: -Del.quantity cm3/1000H.: 65.0 mind

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 900

Charge press. hPa: 1000 TD travel mm: 0.7...1.5 mm: (0.4...1.8)

1/min: 1000 2nd speed

Charge press. hPa: 1000

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TD travel mm: 1.82.2 mm: (1.32.7)	+ Del.quantity cm3/: 44.550.5 + 1000H.: (41.553.5)
3rd speed 1/min: 1100	+ 6th speed 1/min: 1100
Charge press. hPa: 1000	
TD travel mm: 2.43.2	+ Charge press. hPa: 1000
mn: (2.13.5)	Del.quantity cm3/: 64.567.5 1000H.: (63.069.0)
nun: 3.2.13.3)	1000H.: (63.069.0)
Complete memory management of the second second	+ 7th speed 1/min: 900
Supply-pump pressure characteristic:	+ Charge press. hPa: 1000
A-t	+ Del.quantity cm3/: 67.568.5
1st speed 1/min: 600	† 1000H.: (65.071.0)
Charge press. hPa: 1000	+ 8th speed 1/min: 750
Supply-pump	+ Charge press. hPa: 1000
pressure bar: 5.76.3	+ Del.quantity cm3/: 69.073.0
2nd speed 1/min: 900	+ 1000H: (67.075.0)
Charge press. hPa: 1000	+ 9th speed 1/min: 600
Supply-pump	- Charge press. hPa: 1000
pressure bar: 7.17.7	+ Del.quantity cm3/: 72.082.0
3rd speed 1/min: 1000	+ 1000H: -
Charge press. hPa: 1000	† 10th speed 1/min: 600
Supply-pump	+ Charge press. hPa: -
pressure bar: 7.48.0	+ Del.quantity cm3/: 56.057.0
pressure bar: 7.48.0 4th speed 1/min: 1100	1000H: (52.570.5)
Charge press. hPa: 1000	<del> </del>
Supply-pump	8th speed 1/min: 750 Charge press. hPa: 1000 Del.quantity cm3/: 69.073.0 1000H: (67.075.0) 9th speed 1/min: 600 Charge press. hPa: 1000 Del.quantity cm3/: 72.082.0 1000H: - 10th speed 1/min: 600 Charge press. hPa: - Del.quantity cm3/: 56.057.0 1000H: (52.570.5) Zero delivery (stop):
pressure bar: 7.98.5	+
	+ Mech. shutoff:
Overflow quantity at overflow valve:	+
	+ Speed 1/min: 1100
1st speed 1/min: 600	+ Del.quantity cm3/: 03
Charge press. hPa: -	+ 1000H.: -
	1 (000:1
Oveflow : 4183	1000:1.
Oveflow : 4183	+
Oveflow : 4183 quantity cm3/10s: (2698)	Electr. shutoff:
Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed: 1/min: 1100 Charge press. hPa: 1000	Electr. shutoff:
Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed: 1/min: 1100 Charge press. hPa: 1000	+ Electr. shutoff: + Speed 1/min: 340
Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1100 Charge press. hPa: 1000 Overflow: 55138	- Electr. shutoff: - Speed 1/min: 340 - ELAB Volt: -
Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed: 1/min: 1100 Charge press. hPa: 1000	Electr. shutoff:  Speed 1/min: 340 ELAB volt: - Del.quantity cm3/: 0.03.0
Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1100 Charge press. hPa: 1000 Overflow: 55138 quantity cm3/10s: (40153)	- Electr. shutoff: - Speed 1/min: 340 - ELAB Volt: -
Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1100 Charge press. hPa: 1000 Overflow: 55138	Electr. shutoff:  Speed 1/min: 340 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -
Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1100 Charge press. hPa: 1000 Overflow: 55138 quantity cm3/10s: (40153) Delivery-quant. and breakaway char.: 1st speed 1/min: 700	Electr. shutoff:  Speed 1/min: 340 ELAB volt: - Del.quantity cm3/: 0.03.0
Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1100 Charge press. hPa: 1000 Overflow: 55138 quantity cm3/10s: (40153) Delivery-quant. and breakaway char.: 1st speed 1/min: 700	Electr. shutoff:  Speed 1/min: 340 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:
Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1100 Charge press. hPa: 1000 Overflow: 55138 quantity cm3/10s: (40153) Delivery-quant. and breakaway char.: 1st speed 1/min: 700 Charge-air pressure-setting	Electr. shutoff:  Speed 1/min: 340 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 340
Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1100 Charge press. hPa: 1000 Overflow: 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700 Charge-air pressure-setting point hPa: 400	Electr. shutoff:  Speed 1/min: 340 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 340 Del.quantity cm3/: 10.012.0
Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1100 Charge press. hPa: 1000 Overflow: 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700 Charge-air pressure-setting point hPa: 400 LDA stroke: mm: 7,0	Electr. shutoff:  Speed 1/min: 340  ELAB volt: - Del.quantity cm3/: 0.03.0  max. 1000H.: -  Idle delivery:  1st speed 1/min: 340 Del.quantity cm3/: 10.012.0 1000H.: (6.016.0)
Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1100 Charge press. hPa: 1000 Overflow: 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700 Charge-air pressure-setting point hPa: 400 LDA stroke mm: 7,0 Del.quantity cm3/: 66.067.0	Electr. shutoff:  Speed 1/min: 340  ELAB volt: - Del.quantity cm3/: 0.03.0  max. 1000H.: -  Idle delivery:  1st speed 1/min: 340 Del.quantity cm3/: 10.012.0 1000H.: (6.016.0) 2nd speed 1/min: 450
Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1100 Charge press. hPa: 1000 Overflow: 55138 quantity cm3/10s: (40153)  Delivery quant. and breakaway char::  1st speed 1/min: 700 Charge air pressure setting point hPa: 400 LDA stroke mm: 7,0 Del.quantity cm3/: 66.067.0 1000H.: (62.570.5)	Electr. shutoff:  Speed 1/min: 340  ELAB volt: - Del.quantity cm3/: 0.03.0  max. 1000H.: -  Idle delivery:  1st speed 1/min: 340 Del.quantity cm3/: 10.012.0 1000H.: (6.016.0) 2nd speed 1/min: 450 Del.quantity cm3/: 0.04.0
Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1100 Charge press. hPa: 1000 Overflow: 55138 quantity cm3/10s: (40153)  Delivery quant. and breakaway char::  1st speed 1/min: 700 Charge air pressure setting point hPa: 400 LDA stroke: mm: 7,0 Del.quantity cm3/: 66.067.0 1000H.: (62.570.5) 2nd speed 1/min: 1280	Electr. shutoff:  Speed 1/min: 340  ELAB volt: - Del.quantity cm3/: 0.03.0  max. 1000H.: -  Idle delivery:  1st speed 1/min: 340 Del.quantity cm3/: 10.012.0 1000H.: (6.016.0) 2nd speed 1/min: 450
Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1100 Charge press. hPa: 1000 Overflow: 55138 quantity cm3/10s: (40153)  Delivery quant. and breakaway char::  1st speed 1/min: 700 Charge air pressure setting point hPa: 400 LDA stroke: mm: 7,0 Del.quantity: cm3/: 66.067.0 1000H:: (62.570.5) 2nd speed: 1/min: 1280 Charge press. hPa: 1000	Electr. shutoff:  Speed 1/min: 340 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 340 Del.quantity cm3/: 10.012.0 1000H.: (6.016.0) 2nd speed 1/min: 450 Del.quantity cm3/: 0.04.0 1000H.: -
Oveflow: 4183  quantity cm3/10s: (2698)  2nd speed 1/min: 1100  Charge press. hPa: 1000  Overflow: 55138  quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700  Charge-air pressure-setting point hPa: 400  LDA stroke mm: 7,0  Del.quantity cm3/: 66.067.0  1000H: (62.570.5)  2nd speed 1/min: 1280  Charge press. hPa: 1000  Del.quantity cm3/: 0.03.0	Electr. shutoff:  Speed 1/min: 340  ELAB volt: - Del.quantity cm3/: 0.03.0  max. 1000H.: -  Idle delivery:  1st speed 1/min: 340 Del.quantity cm3/: 10.012.0 1000H.: (6.016.0) 2nd speed 1/min: 450 Del.quantity cm3/: 0.04.0
Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1100 Charge press. hPa: 1000 Overflow: 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700 Charge-air pressure-setting point hPa: 400 LDA stroke mm: 7,0 Del.quantity cm3/: 66.067.0 1000H.: (62.570.5) 2nd speed 1/min: 1280 Charge press. hPa: 1000 Del.quantity cm3/: 0.03.0 1000H.: -	Electr. shutoff:  Speed 1/min: 340 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 340 Del.quantity cm3/: 10.012.0 1000H.: (6.016.0) 2nd speed 1/min: 450 Del.quantity cm3/: 0.04.0 1000H.: -  Automatic starting fuel delivery:
Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1100 Charge press. hPa: 1000 Overflow: 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700 Charge-air pressure-setting point hPa: 400 LDA stroke mm: 7,0 Del.quantity cm3/: 66.067.0 1000H.: (62.570.5) 2nd speed 1/min: 1280 Charge press. hPa: 1000 Del.quantity cm3/: 0.03.0 1000H.: - 3rd speed 1/min: 1230	Electr. shutoff:  Speed 1/min: 340 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 340 Del.quantity cm3/: 10.012.0 1000H.: (6.016.0) 2nd speed 1/min: 450 Del.quantity cm3/: 0.04.0 1000H.: -  Automatic starting fuel delivery:  1st speed 1/min: 350
Oveflow : 4183  quantity cm3/10s: (2698)  2nd speed 1/min: 1100  Charge press. hPa: 1000  Overflow : 55138  quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700  Charge-air pressure-setting  point hPa: 400  LDA stroke mm: 7,0  Del.quantity cm3/: 66.067.0  1000H.: (62.570.5)  2nd speed 1/min: 1280  Charge press. hPa: 1000  Del.quantity cm3/: 0.03.0  1000H.: -  3rd speed 1/min: 1230  Charge press. hPa: 1000	Electr. shutoff:  Speed 1/min: 340 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 340 Del.quantity cm3/: 10.012.0 1000H.: (6.016.0) 2nd speed 1/min: 450 Del.quantity cm3/: 0.04.0 1000H.: -  Automatic starting fuel delivery:  1st speed 1/min: 350 Charge press. hPa: -
oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1100 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700 Charge-air pressure-setting point hPa: 400 LDA stroke mm: 7,0 Del.quantity cm3/: 66.067.0 1000H.: (62.570.5) 2nd speed 1/min: 1280 Charge press. hPa: 1000 Del.quantity cm3/: 0.03.0 1000H.: - 3rd speed 1/min: 1230 Charge press. hPa: 1000 Del.quantity cm3/: 0.015.0	Electr. shutoff:  Speed 1/min: 340 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 340 Del.quantity cm3/: 10.012.0 1000H.: (6.016.0) 2nd speed 1/min: 450 Del.quantity cm3/: 0.04.0 1000H.: -  Automatic starting fuel delivery:  1st speed 1/min: 350 Charge press. hPa: - Del.quantity cm3/: -
oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1100 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700 Charge-air pressure-setting point hPa: 400 LDA stroke mm: 7,0 Del.quantity cm3/: 66.067.0 1000H.: (62.570.5)  2nd speed 1/min: 1280 Charge press. hPa: 1000 Del.quantity cm3/: 0.03.0 1000H.: - 3rd speed 1/min: 1230 Charge press. hPa: 1000 Del.quantity cm3/: 0.015.0 Del.quantity cm3/: 0.015.0	Electr. shutoff:  Speed 1/min: 340 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 340 Del.quantity cm3/: 10.012.0 1000H.: (6.016.0) 2nd speed 1/min: 450 Del.quantity cm3/: 0.04.0 1000H.: -  Automatic starting fuel delivery:  1st speed 1/min: 350 Charge press. hPa: -
Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1100 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700 Charge-air pressure-setting point hPa: 400 LDA stroke mm: 7,0 Del.quantity cm3/: 66.067.0	Electr. shutoff:  Speed 1/min: 340 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 340 Del.quantity cm3/: 10.012.0 1000H.: (6.016.0) 2nd speed 1/min: 450 Del.quantity cm3/: 0.04.0 1000H.: -  Automatic starting fuel delivery:  1st speed 1/min: 350 Charge press. hPa: - Del.quantity cm3/: - ind. 1000H: 70.0
Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1100 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700 Charge-air pressure-setting point hPa: 400 LDA stroke mm: 7,0 Del.quantity cm3/: 66.067.0	Electr. shutoff:  Speed 1/min: 340 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 340 Del.quantity cm3/: 10.012.0 1000H.: (6.016.0) 2nd speed 1/min: 450 Del.quantity cm3/: 0.04.0 1000H.: -  Automatic starting fuel delivery:  1st speed 1/min: 350 Charge press. hPa: - Del.quantity cm3/: - ind. 1000H: 70.0  2nd speed 1/min: 480
oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1100 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery quant. and breakaway char.:  1st speed 1/min: 700 Charge air pressure setting point hPa: 400 LDA stroke mm: 7,0 Del.quantity cm3/: 66.067.0	Electr. shutoff:  Speed 1/min: 340 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 340 Del.quantity cm3/: 10.012.0 1000H.: (6.016.0) 2nd speed 1/min: 450 Del.quantity cm3/: 0.04.0 1000H.: -  Automatic starting fuel delivery:  1st speed 1/min: 350 Charge press. hPa: - Del.quantity cm3/: - ind. 1000H: 70.0  2nd speed 1/min: 480 Charge press. hPa: -
oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1100 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery quant. and breakaway char.:  1st speed 1/min: 700 Charge air pressure setting point hPa: 400 LDA stroke mm: 7,0 Del.quantity cm3/: 66.067.0	Electr. shutoff:  Speed 1/min: 340 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 340 Del.quantity cm3/: 10.012.0 1000H.: (6.016.0) 2nd speed 1/min: 450 Del.quantity cm3/: 0.04.0 1000H.: -  Automatic starting fuel delivery:  1st speed 1/min: 350 Charge press. hPa: - Del.quantity cm3/: - ind. 1000H: 70.0  2nd speed 1/min: 480 Charge press. hPa: - Del.quantity cm3/: -
oveflow quantity cm3/10s: (2698) 2nd speed 1/min: 1100 Charge press. hPa: 1000 Overflow quantity cm3/10s: (40153)  Delivery quant. and breakaway char.:  1st speed 1/min: 700 Charge air pressure setting point hPa: 400 LDA stroke mm: 7,0 Del.quantity cm3/: 66.067.0 1000H.: (62.570.5)  2nd speed 1/min: 1280 Charge press. hPa: 1000 Del.quantity cm3/: 0.03.0 1000H.:  3rd speed 1/min: 1230 Charge press. hPa: 1000 Del.quantity cm3/: 0.015.0 1000H.: 4th speed 1/min: 1200 Charge press. hPa: 1000 Del.quantity cm3/: 15.055.0 1000H.: 5th speed 1/min: 1170	Electr. shutoff:  Speed 1/min: 340 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 340 Del.quantity cm3/: 10.012.0 1000H.: (6.016.0) 2nd speed 1/min: 450 Del.quantity cm3/: 0.04.0 1000H.: -  Automatic starting fuel delivery:  1st speed 1/min: 350 Charge press. hPa: - Del.quantity cm3/: - ind. 1000H: 70.0  2nd speed 1/min: 480 Charge press. hPa: -
oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1100 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery quant. and breakaway char.:  1st speed 1/min: 700 Charge air pressure setting point hPa: 400 LDA stroke mm: 7,0 Del.quantity cm3/: 66.067.0	Electr. shutoff:  Speed 1/min: 340 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 340 Del.quantity cm3/: 10.012.0 1000H.: (6.016.0) 2nd speed 1/min: 450 Del.quantity cm3/: 0.04.0 1000H.: -  Automatic starting fuel delivery:  1st speed 1/min: 350 Charge press. hPa: - Del.quantity cm3/: - ind. 1000H: 70.0  2nd speed 1/min: 480 Charge press. hPa: - Del.quantity cm3/: -

Cut-in min. voltage Rated voltage : 10.0 : 12.0

# Mounting and assembly dimensions:

Designation K KF MS SVS max. XK XL mm mm : -mm : 5.0...5.4 mm : 1.3...1.7 mm : 1.0 mm : 21,8...23,8 mm : 11,7...15,1

Remarks:

Note inst. in remarks column

: CUM 5,9 U15 Test sheet Edition : 31.01.89

replaces

Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R320 : 0 460 426 114 Type number

Customer-specific information

Customer : CDC

Engine : 6 BT-590A

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

assembly : 1 688 901 027

Openina

bar: 250...253 pressure

Perforated plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Start of delivery Prestroke mn : -(from BDC): -

Start of delivery block Piston stroke mm: 1.4

mn: +-0.02(0.06)

Outlet

Injection pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100 Charge press. hPa: 1200 Setting value mm: 1.3...1.7

KSB solenoid-operated valve

volt: 12.0

Supply-pump pressure:

Speed 1/min: 1:00 Charge press. hPa: 1200 Setting value bar: 6.8...7.4

KSB solenoid-operated

valve volt: 12.0

Full-load del. with charge press.:

Speed 1/min: 1100 Charge press. hPa: 1200 Del.quantity cm3/ 1000H.: 75.5...76.5

KSB solenoid-operated volt: 12.0 valve Dispersion cm3/: 4.0 1000H : (4.5)

Full-load del. w/out charge press.:

Speed  $1/\min : 500$ 

Del.quantity cm3/ 1000H.: 51.0...52.0

KSB solenoid-operated volt: 12.0 cm3/: 9.0 valve Dispersion 1000H.: -

Low-idle speed regulation:

Speed 1/min: 350 Charge press. hPa: Del.quantity cm3/
1000H.: 5.5...9.5

KSB solenoid-operated volt: 12.0 cm3/: 5.5 valve Dispersion 1000H .: (7.0)

Full-load speed regulation:

Speed 1/min: 1340 Charge press. hPa: 1200 Del.quantity cm3/ 1000H: 52.5...58.5

KSB solenoid-operated valve volt: 12.0

Start:

1/min: 100 Speed Charge press. hPa: -Del.quantity mind cm3/1000H.: 60.0

KSB solenoid-operated valve volt: 12.0	+ KSB solenoid-operated + valve volt: 12.0
Inspection-pump test specifications Test specifications in parentheses	Oveflow : 4183
Timing-device characteristic:	+ Charge press. hPa: 1200 + KSB solenoid-operated + valve volt: 12.0 - Overflow : 55138
1st speed 1/min: 450 Charge press. hPa: - TD travel mm: 3.04.0	quantity cm3/10s: (40153)
mn: —	+ Delivery-quant. and breakaway char.
KSB solenoid-operated valve volt: -	† 1st speed 1/min: 700 † Charge-air pressure-setting
2nd speed 1/min: 1000	+ point hPa: 700
Charge press. hPa: 1200	+ LDA stroke mm: -
TD travel mm: 0.51.3 mm: (0.21.6)	+ KSB solenoid-operated + valve volt: 12.0
KSB solenoid-operated	+ valve volt: 12.0 + Del quantity cm3/: 68.0 69.0
valve volt: 12.0	Del.quantity cm3/: 68.069.0 1000H.: (64.572.5)
3rd speed 1/min: 1100	+ 2nd speed 1/min: 1550
Charge press. hPa: 1200	+ Charge press. hPa: 1200
TD travel mm: 1.31.7 mm: (0.82.2)	+ KSB solenoid-operated + valve volt: 12.0
KSB solenoid operated	+ Del.quantity cm3/: 0.03.0
valve volt: 12.0	+ Del.quantity cm3/: 0.03.0 + 1000H.: -
4th speed 1/min: 1250	+ 3rd speed 1/min: 1450
Charge press. hPa: 1200 TD travel mm: 2.23.0	+ Charge press. hPa: 1200 + KSB solenoid-operated
mm: (1.93.3)	+ valve volt: 12
KSB solenoid-operated	+ Del.quantity cm3/: 0.015.0
valve volt: 12.0	Del.quantity cm3/: 0.015.0
Complete property about the second	+ 4th speed 1/min: 1410
Supply-pump pressure characteristic:	+ Charge press. hPa: 1200 + KSB solenoid-operated
1st speed 1/min: 500	+ valve volt: 12.0
Charge press. hPa: 1200	Del.quantity cm3/: 15.055.0
Supply-pump	1000H.: -
pressure bar: 4.14.7 KSB solenoid-operated	† 5th speed 1/min: 1340 † Charge press. hPa: 1200
valve volt: 12.0	KSB solenoid-operated
2nd speed 1/min: 1100	+ valve volt: 12.0
Charge press. hPa: 1200	+ Del.quantity cm3/: 52.558.5
Supply-pump pressure bar: 6.87.4	1000H.: (49.561.5) + 6th speed 1/min: 1250
KSB solenoid-operated	Charge press. hPa: 1200
valve volt: 12.0	+ KSB solenoid-operated
3rd speed 1/min: 1250	+ valve volt: 12.0
Charge press. hPa: 1200 Supply-pump	+ Del.quantity cm3/: 71.574.5 + 1000H.: (70.076.0)
pressure bar: 7.58.1	7th speed 1/min: 1100
KSB solenoid-operated	+ Charge press. hPa: 1200
valve volt: 12.0	+ KSB solenoid-operated
Overflow quantity at overflow valve:	+ valve volt: 12.0 + Del.quantity cm3/: 75.576.5 + 1000H.: (73.079.0)
1st speed 1/min: 500	+ 8th speed 1/min: 750
Charge press. hPa: -	+ Charge press. hPa: 1200
	+

KSB solenoid-operated volt: 12.0 valve Del.quantity cm3/: 75.0...80.0 10004: (73.0...82.0) 1/min: 500 9th speed Charge press. hPa: 1200 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 82.0...94.0 1000H: -1/min: 500 10th speed Charge press. hPa: -KSB solenoid-operated volt: 12.0 valve Del.quantity cm3/: 51.5...52.5 1000H: (48.0...56.0) Zero delivery (stop): Mech. shutoff: 1/min: 1250 Speed Del.quantity cm3/: 0..3 1000H.: -Electr. shutoff: Speed 1/min: 350 ELAB volt: -Del.quantity cm3/: 0.0...3.0 max. 1000H.: max. Idle delivery: 1st speed 1/min: 300 KSB solenoid-operated volt: 12.0 valve Del.quantity cm3/: 8.5...16.5 1000H.: -1/min: 350 2nd speed KSB solenoid-operated Valve Volt: 12.0 Del.quantity cm3/: 5.5...9.5 \_\_\_\_\_\_1000H.: (2.5...12.5) 1/min: 450 3rd speed KSB solenoid-operated volt: 12.0 valve Del.quantity cm3/: 0.0...4.0 1000H.: -Automatic starting fuel delivery: 1st speed 1/min: 130 Charge press. hPa: -KSB solenoid operated valve volt: 12.0 Del.quantity cm3/: -1000H: 60.0 ind. 2nd speed 1/min: 250

Charge press. hPa: -KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: max. 1000H: 50.0

## Shutoff electromagnet:

Cut-in

min. voltage : 10,0 Rated voltage : 12,0

### Mounting and assembly dimensions:

Designation

: 3.6...3.8 mm KF : K-0T mm 1.0...1.4 MS mm SVS max. : 1,4 mm FH mm XK mm : -XL mm : -

#### Remarks:

D14

Note inst. in remarks column

Test sheet : HEP 5,6 A Edition : 01.02.89

replaces

Calibrating oil : ISO 4113

: VE 6/12F1400 R332 Injection pump

: 0 460 426 121 Type number

Customer-specific information Customer : HERCULES

: DT 5.6 L Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer: 40...48 : 42...50 electronically

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening

bar: 250...253 pressure

Perforated plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter x Wall thickness : 2 mm : 840 x Length

Start of delivery

Prestroke mn : 0.3

(from BDC): +0.02(0,04)

Start of delivery block Piston stroke mm: 1.1 mm: +-0.02Outlet

Injection-pump setting values Test specifications in parentheses

Timing device travel:

Speed 1/min: 900 Charge press. hPa: 1000 Setting value mm: 5.0...5.4

Supply-pump pressure:

1/min: 900 Speed Charge press. hPa: 1000 Setting value bar: 3.9...4.5

Full-load del. with charge press.:

Speed 1/min: 900 Charge press. hPa: 1000 Del.quantity cm3/ 1000H.: 64.5...65.5

cm3/: 4.0 1000H: (4.5) Dispersion

Full-load del. w/out charge press.:

Speed 1/min : 500 Del.quantity cm3/

1000H.: 19.0...20.0

cm3/: 9.0 Dispersion 1000H .: -

Low-idle speed regulation:

Speed 1/min: 375

Del.quantity cm3/ 1000H.: 6.0...8.0

cm3/: 5.5 Dispersion

1000H .: (7.0)

Full-load speed regulation:

1/min: 1500 Speed Charge press. hPa: 1000

Del.quantity cm3/ 1000H: 45.0...51.0

Start:

Speed 1/min: 100 Del.quantity cm3/1000H.: 30.0 mind i

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 700 Charge press. hPa: 1000

mm: 2.9...3.7 mm: (2.6...4.0) 1/min: 900 TD travel

2nd speed Charge press. hPa: 1000

mm: 5.0...5.4 TD travel mm: (4.5...5.9)

**D15** 

3rd speed 1/min: 1400 Charge press. hPa: 1000 TD travel mm: 6.27.0 mm: (5.76.7)	the Charge press. hPa: 1100  Del.quantity cm3/: 64.067.0  1000H.: (62.069.0)  8th speed 1/min: 900  Charge press. hPa: 1000
Supply-pump pressure characteristic:	Del.quantity cm3/: 64.565.5 1000H: (62.068.0)
1st speed 1/min: 500 Charge press. hPa: 1000 Supply-pump pressure bar: 2.12.7 2nd speed 1/min: 900	9th speed 1/min: 500 Charge press. hPa: 1000 Del.quantity cm3/: 67.077.0 1000H: - 10th speed 1/min: 500
Charge press. hPa: 1000 Supply-pump pressure bar: 3.94.5 3rd speed 1/min: 1400	Charge press. hPa: - Del.quantity cm3/: 19.020.0 1000H: (15.523.5)
Charge press. hPa: 1000 Supply-pump	† Zero delivery (stop):
pressure bar: 5.96.5	Mech. shutoff:
Overflow quantity at overflow valve:	Speed 1/min: 1400 Del.quantity cm3/: 03
1st speed 1/min: 500 Charge press. hPa: 1000 Oveflow : 4183	1000H.: - Electr. shutoff:
quantity cm3/10s: (2698) 2nd speed  1/min: 1400	Speed 1/min: 375
Charge press. hPa: 1000	+ ELAB volt: -
Overflow : 55138 quantity cm3/10s: (40153)	Del.quantity cm3/: 0.03.0 max. 1000H.: -
Delivery-quant. and breakaway char.:	Idle delivery:
1st speed 1/min: 700 Charge-air pressure-setting point hPa: 550 LDA stroke mm: - Del.quantity cm3/: 52.553.5 1000H.: (49.057.0) 2nd speed 1/min: 1680	1st speed 1/min: 375 Del.quantity cm3/: 6.07.0 1000H.: (2.012.0) 2nd speed 1/min: 450 Del.quantity cm3/: 0.04.0 1000H.: -
Charge press. hPa: 1000	Automatic starting fuel delivery:
Del.quantity cm3/: 0.03.0 1000H.: - 3rd speed 1/min: 1630 Charge press. hPa: 1000 Del.quantity cm3/: 0.015.0	1st speed 1/min: 270 Del.quantity cm3/: - ind. 1000H: 45.0
1000H.: - 4th speed 1/min: 1590 Charge press. hPa: 1000 Del.quantity cm3/: 15.055.0	2nd speed 1/min: 400 Del.quantity cm3/: - max. 1000H: 45.0
1000H.: - 5th speed	Shutoff electromagnet:
Charge press. hPa: 1000	+ Cut-in
Del.quantity cm3/: 45.051.0 1000H.: (42.054.0)	min. voltage : 10.0 Rated voltage : 12.0
6th speed	Mounting and assembly dimensions:
1000H.: (59.065.0) 7th speed 1/min: 1100	Designation mm · -

KF MS SVS max. XK XL : 5.0...5.4 : 1.1...1.5 mm mn

Remarks:

Note inst. in remarks column

: CUM 5,9 U16 Test sheet Edition : 02.02.89

replaces

Calibrating oil : ISO 4113

Injection pump : VE 6/12F1050 R173-11

: 0 460 426 125 Type number

Customer-specific information

Customer : CDC

Engine : 6BTA- 5.9 I

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening |

bar: 250...253 pressure

Perforated-plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Start of delivery

Prestroke mm: 0.3

(from BDC): +-0.02(0.04)

Start of delivery block Piston stroke mm: 1.85

mm: +-0.02(0.06)

Outlet

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750 Charge press. hPa: 1000

D18

Setting value mm: 1.5...1.9

Supply-pump pressure:

1/min: 750 Speed Charge press. hPa: 1000 Setting value bar: 2.9...3.5

Full-load del. with charge press.:

Speed 1/min: 750 Charge press. hPa: 1000

Del.quantity cm3/ 1000H.: 94.5...95.5

cm3/:4.0Dispersion

1000H: (4.5)

Full-load del. w/out charge press.:

1/min : 500 Speed

Del.quantity cm3/ 1000H.: 50.5...51.5

Dispersion cm3/: 9.0

1000H.: -

Low-idle speed regulation:

Speed 1/min: 375

Speed
Del.quantity cm3/
1000H.: 8.0...12.0
Dispersion cm3/: 5.5

1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1100 Charge press. hPa: 1000

Del.quantity cm3/

1000H: 73.0...79.0

Start:

1/min: 100 Speed Del.quantity cm3/1000H.: 60.0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600 Charge press. hPa: 1000

TD travel mm: 0.5...1.3

mm: (0.2...1.6)

1/min: 750 2nd speed Charge press. hPa: 1000

mm: 1.5...1.9 TD travel

mm: (1.0...2.4)

3rd speed 1/min: 1050 Charge press. hPa: 1000 TD travel mm: 2.53.3	† †	Del.quantity cm3/: 87.590.5 1000H.: (86.092.0) 8th speed 1/min: 750
mm: (2.23.6)	‡	Charge press. hPa: 1000 Del.quantity cm3/: 94.595.5
Supply-pump pressure characteristic:	‡	9th speed 1000H: (92.098.0) 1/min: 500
1st speed 1/min: 500 Charge press. hPa: 1000 Supply-pump	† †	Charge press. hPa: 1000 Del.quantity cm3/: 98.0106.0 1000H: -
pressure bar: 1.82.4 2nd speed 1/min: 750 Charge press. hPa: 1000	‡	10th speed 1/min: 500 Charge press. hPa: - Del.quantity cm3/: 50.551.5
Supply-pump pressure bar: 2.93.5 3rd speed 1/min: 1050	‡	1000H: (46.555.5)
Charge press. hPa: 1000	‡	Zero delivery (stop):
Supply-pump pressure bar: 4.34.9	‡	Mech. shutoff:
Overflow quantity at overflow valve:	+++++++++++++++++++++++++++++++++++++++	Speed 1/min: 1050 Del.quantity cm3/: 03 1000H.: -
1st speed	‡	Electr. shutoff:
2nd speed		Speed 1/min: 375 ELAB volt: -
Overflow : 55138 quantity cm3/10s: (40153)		Del.quantity cm3/: 0.03.0 max. 1000H.: -
Delivery-quant. and breakaway char.:	Ī	Idle delivery:
1st speed 1/min: 700 Charge-air pressure-setting point hPa: 300	<del> </del>	1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0)
LDA stroke mm: — Del.quantity cm3/: 79.580.5 1000H.: (76.584.5)	+	2nd speed 1/min: 500 Del.quantity cm3/: 0.04.0 1000H.: -
2nd speed 1/min: 1200 Charge press. hPa: 1000 Del.quantity cm3/: 0.03.0	+	Automatic starting fuel delivery:
1000H.: - 3rd speed 1/min: 1170 Charge press. hPa: 1000 Del.quantity cm3/: 0.015.0	†   	1st speed
1000H.: - 4th speed	+	2nd speed 1/min: 450 Del.quantity cm3/: -
Charge press. hPa: 1000 Del.quantity cm3/: 15.055.0		max. 1000H : 55.0
1000H.: - 5th speed	+ :	Shutoff electromagnet:
Charge press. hPa: 1000	+	Cut-in min. voltage : 20.0 Rated voltage : 24.0
oth speed 1/min: 1050 - Charge press. hPa: 1000 - Del.quantity cm3/: 83.586.5 -	‡ '	Mounting and assembly dimensions:
1000H.: (82.088.0) - 7th speed 1/min: 900 -		Designation K mm : -
Charge press. hPa: 1000	∔ i	KF mm : 5.05.4

Remarks:

Note inst. in remarks column

: CUM 5.9 U18 Test sheet Edition : 02.02.89

replaces

Calibrating oil : ISO 4113

Injection pump : VE 6/12F1050 R225-19

Type number : 0 460 426 127

Customer-specific information : CUMMINS/GB

Engine : 68T-5.9 IND

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

assembly : 1 688 901 0207

**Opening** 

pressure bar: 250...253

Perforated-plate

diameter mn : 0.5

Test ini. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Start of delivery

Prestroke mn: 0.3

(from BDC): +-0.02(0.04)

Start of delivery block Piston stroke mm: 1.5

mm: +-0.02(0.06)

Outlet

Injection-pump setting values Test specifications in parentheses

Timing device travel:

Speed 1/min: 750

Setting value mm: 3.4...3.8

Supply-pump pressure:

Speed 1/min: 750 Setting value bar: 3.7...4.3

Full-load del. w/out charge press.:

1/min: 750 Speed

Del.quantity cm3/

1000H.: 73.0...74.0

Dispersion cm3/: 4.0

1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 375

Speed Del.quantity cm3/ 1000H.: 8.0...14.0 hisnersion cm3/: 5.5 (7.0)

Full-load speed regulation:

Speed 1/min: 1100

Del.quantity cm3/

1000H: 52.0...58.0

Start:

Speed 1/min: 100

Del.quantity

cm3/1000H.: 60.0 mind

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500

TD travel mm: 1.2...2.0

mm: (0.9...2.3)

1/min: 750 2nd speed

TD travel mm: 3.4...3.8

mm: (2.9...4.3) 1/min: 1050 3rd speed

TD travel

mm: 4.9...5.7 mm: (4.6...6.0)

Supply-pump pressure characteristic:

1/min: 500 1st speed

Supply-pump

bar: 2.6...3.2 pressure

2nd speed 1/min: 750

Supply-pump

bar: 3.7...4.3 1/min: 1050 pressure

3rd speed

021

Supply-pump bar: 4.9...5.5 pressure Overflow quantity at overflow valve: 1st speed 1/min: 500 Oveflow : 41...83 cm3/10s: (26...98) quantity 2nd speed 1/min: 1050 Overflow : 55...138 quantity cm3/10s: (40...153) Delivery-quant. and breakaway char .: 1st speed 1/min: 1200 Del.quantity cm3/: 0.0...3.0 1000H.: -2nd speed 1/min: 1170 Del.quaratity cm3/: 0.0...15.0 1000H.: -1/min: 1130 3rd speed Del.quantity cm3/: 1: cm3/: 15.0...55.0 4th speed 1/min: 1100
Del.quantity cm3/: 52.0...58.0
1000H.: (49.0...61.0)
5th speed 1/min: 1050
Del.quantity cm3/: 68.5...71.5 1/min: 900 6th speed Del.quantity cm3/: 71.0...74.0 1000H.: (69.0...76.0) 1/min: 750 7th speed Del.quantity cm3/: 73.0...74.0 1000H.: (70.5...76.5) 8th speed 1/min: 500 Del.quantity cm3/: 59.0...67.0 1000H: (57.0...69.0) Zero delivery (stop): Mech. shutoff: Speed 1/min: 1050 Del.quantity cm3/: 0..3 1000H.: -Electr. shutoff: Speed 1/min: 375 ELAB volt: -Del.quantity cm3/: 0.0...3.0 max. 1000H.: -Idle delivery: 1st speed 1/min: 375
Del.quantity cm3/: 8.0...14.0
1000H.: (6.0...16.0)

Del.quantity cm3/: 0.0...4.0 1000H.: -Automatic starting fuel delivery: 1/min: 130 1st speed Del.quantity cm3/: -1000H: 60.0 ind. 2nd speed 1/min: 240 Del.quantity cm3/: - max. 1000H: 60.0 Shutoff electromagnet: Cut-in : 20.0 min. voltage Rated voltage : 24.0 Mounting and assembly dimensions: Designation mm KF mm : 5.0...5.4 mm: 0.8...1.2 MS SVS max. mm : 2.2 Remarks:

2nd speed

1/min: 450

Note inst. in remarks column

: CUM 5,9 U19 Test sheet Edition : 02.02.89

replaces

Calibrating oil : ISO 4113

Injection pump : VE 6/12F1050 R225-20

Type number : 0 460 426 128

Customer-specific information

Customer : CDC

Engine : 6BT- 5.9 IND

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 035

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening |

pressure bar: 250...253

Perforated-plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Start of delivery

Prestroke mm : 0.3

(from BDC): +-0.02(0.04)

Start of delivery block Piston stroke mm: 1.5

mm: +-0.02(0.06)

Outlet

Injection pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750

Setting value mm: 3.4...3.8

Supply-pump pressure:

Speed 1/min: 750 Setting value bar: 3.5...4.1

Full-load del. w/out charge press.:

Speed 1/min : 750

Del.quantity cm3/

1000H.: 64.5...65.5

Dispersion cm3/: 4.01000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 375

Del.quantity cm3/

1000H.: 10.0...12.0 cm3/: 5.5

Dispersion

1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1100

Del.quantity cm3/ 1000H: 46.0...52.0

Start:

Speed 1/min: 100

Del.quantity

mind ' cm3/1000H.: 70.0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500

mm: 1.5...2.4 TD travel

mm: (1.2...2.6)

2nd speed 1/min: 750

mm: 3.4...3.8 mm: (2.9...4.3) TD travel

1/min: 1050 3rd speed

TD travel mm: 5.0...5.8

mm: (4.7...6.1)

Supply-pump pressure characteristic:

Mfg. date: until : 500

Supply-pump

bar: 2.4...3.0 pressure

2nd speed 1/min: 750

Supply-pump

bar: 3.5...4.1 1/min: 1050 pressure

3rd speed

D23

Supply-pump bar: 4.6...5.2 pressure Overflow quantity at overflow valve: 1st speed 1/min: 500 Oveflow : 41...83 cm3/10s: (26...98) *duantity* 2nd speed 1/min: 1050 Overflow : 55...138 quantity cm3/10s: (40...153) Delivery-quant, and breakaway char.: 1st speed 1/min: 1250 Del.quantity cm3/: 0.0...3.0 1000H.: -2nd speed 1/min: 1160 Del.quantity cm3/: 0.0...15.0 1000H.: -3rd speed 1/min: 1130 Del.quantity cm3/: 15.0...55.0 1000H.: -4th speed 1/min: 1100 Del.quantity cm3/: 46.0...52.0 1000H.: (43.0...55.0) 1/min: 1050 5th speed Del.quantity cm3/: 60.5...63.5 1000H.: (59.0...65.0) 1/min: 900 6th speed Del.quantity cm3/: 62.0...65.0 1000H.: (60.0...67.0) 7th speed 1/min: 750 Del.quantity cm3/: 64.5...65.5 1000H.: (62.0...68.0) 8th speed 1/min: 500 Del.quantity cm3/: 64.0...72.0 1000H: -Zero delivery (stop): Mech. shutoff: 1/min: 1050 Del.quantity cm3/: 0..3 1000H .: -Electr. shutoff: Speed 1/min: 375 ELAB volt: -Del.quantity cm3/: 0.0...3.0 max. 1000H.: -Idle delivery: 1/min: 375 1st speed Del.quantity cm3/: 10.0..12.0

1000H.: (6.0...16.0)

1/min: 500

Del.quantity cm3/: 0.0...4.0 1000H.: -Automatic starting fuel delivery: 1/min: 130 1st speed Del.quantity cm3/: -1000H: 70.0 ind. 2nd speed 1/min: 350 Del.quantity cm3/: - max. 1000H: 70.0 Shutoff electromagnet: Cut-in : 20.0 min. voltage Rated voltage : 24.0 Mounting and assembly dimensions: Designation mn KF : 5.0...5.4 MS : 1.2...1.6 mm SVS max. mm XK mm XL mm : -Remarks:

2nd speed

Note inst. in remarks column

: CUM 5.9 U20 Test sheet Edition : 0.2.02.89

replaces

Calibrating oil : ISO 4113

Injection pump : VE 6/12F1050 R225-18

: 0 460 426 129 Type number

Customer-specific information

Customer : CDC

Engine : 68T-5.9 IND

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer: 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 027 assembly

Openina .

bar: 250...253 pressure

Perforated plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 x Length mm: 840

Start of delivery

Prestroke mm : 0.3

(from BDC): +-0.02 (0,04)

Start of delivery block Piston stroke mm: 1.5

mm: +-0.02(0.06)

Outlet

Injection pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750

Setting value mm: 3.4...3.8

Supply-pump pressure:

1/min: 750 Speed Setting value bar: 3.7...4.3

Full-load del. w/out charge press.:

1/min: 750 Speed 

Dispersion cm3/: 4.0

1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 375

Speed
Del.quantity cm3/
1000H.: 10.0...12.0
Dispersion cm3/: 5.5

1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1100

Del.quantity cm3/

1000H: 52.0...58.0

Start:

1/min: 100 Speed Del.quantity

cm3/1000H.: 60.0

Inspection pump test specifications Test specifications in parentheses

Timing device characteristic:

1st speed

1/min: 500 mm: 1.4...2.2 mm: (1.1...2.5) TD travel

2nd speed 1/min: 750

TD travel mm: 3.4...3.8

mm: (2.9...4.3) 1/min: 1050

3rd speed TD travel

mm: 4.6...5.4 mm: (4.3...5.7)

Supply-pump pressure characteristic:

1st speed 1/min: 500

Supply-pump

bar: 2.6...3.2 pressure

1/min: 750 2nd speed

Supply-pump

bar: 3.7...4.3 pressure

1/min: 1050 3rd speed

D25

Supply-pump pressure bar: 4.95.5
Overflow quantity at overflow valve:
1st speed
Delivery-quant. and breakaway char.:
1st speed 1/min: 1200 Del.quantity cm3/: 0.03.0 1000H.: - 2nd speed 1/min: 1170 Del.quantity cm3/: 0.015.0
1000H.: - 3rd speed 1/min: 1130 Del.quantity cm3/: 15.055.0 1000H.: - 4th speed 1/min: 1100
Del.quantity cm3/: 52.058.0 1000H.: (49.061.0)
5th speed
1000H.: (67.073.0) 6th speed 1/min: 900 Del.quantity cm3/: 71.574.5 1000H.: (69.574.5)
7th speed 1/min: 750 Del.quantity cm3/: 75.076.0
1000H:: (72.578.5) 8th speed 1/min: 500 Del.quantity cm3/: 59.567.5 1000H: (57.569.5)
Zero delivery (stop):
Mech. shutoff:
Speed 1/min: 1050 Del.quantity cm3/: 03 1000H.: -
Electr. shutoff:
Speed 1/min: 375 ELAB volt: 12.0 Del.quantity cm3/: 0.03.0 max. 1000H.: -
Idle delivery:
1st speed

Del.quantity cm3/: 0.0...4.0 1000H.: -Automatic starting fuel delivery: 1st speed 1/min: 130 Del.quantity cm3/: -ind. 1000H: 60.0 1/min: 240 2nd speed Del.quantity cm3/: -max. 1000H: 60.0 Shutoff electromagnet: Cut-in min. voltage : 10.0 Rated voltage : 12.0 Mounting and assembly dimensions: Designation K mm : mm : 5.0...5.4 mm : 0.8...1.2 KF MS SVS max. mm : -XK mm : -XL mm : -Remarks:

Note inst. in remarks column

Test sheet : REN 2.0 P Edition : 10.03.89

replaces

Calibrating oil : ISO 4113

Injection pump : VE 4/8F2300 R317 Type number : 0 460 484 020

Customer-specific information

Customer

: RNUR

Engine

: F8Q-A06

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer: 40...48 : 42...50 electronically

Inlet press., bar: 0,35

Calibrating nozzle-holder

assembly : 1 688 901 022

**Openina** 

bar: 130...133 pressure

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 mm : 450 x Lenath

Start of delivery Prestroke mm : -(from BDC): -

Indicator setting:

Piston stroke mm: 1.0 Outlet : A

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1250 Speed Setting value mm: 3,8...4,2

KSB solenoid-operated valve volt: -

Supply-pump pressure:

1/min: 1250 Speed Setting value bar: 4,5...5,1 KSB solenoid-operated

valve volt: -

Full-load del. w/out charge press.:

1/min: 1250 Speed

Del.quantity cm3/ 1000H.: 31,5...32,5

KSB solenoid-operated valve volt: cm3/: 2,5 Dispersion 1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 400

Del.quantity cm3/ 1000H.: 4,0...8,0

KSB solenoid-operated volt: cm3/: 2,5 Dispersion 1000H.: (3,0)

Residual-Delivery Setting Speed 1/min: 500 Del.quantity cm3/ 1000H.: 1,0...5,0

KSB-Solenoid-Operated valve Volt : -

Full-load speed regulation:

Speed 1/min: 2450 Del.quantity cm3/ 1000H: 24,0...30,0

KSB solenoid-operated valve volt: -

Start:

1/min: 100 Speed Del.quantity cm3/1000H.: 40.0 KSB solenoid-operated valve volt: -

Load-dependent start of delivery:

Speed 1/min: 1250 KSB solenoid-operated valve volt: -

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

TD travel mm: 0,32,7	+ Overflow : 55138 + quantity cm3/10s: (40153)
KSB solenoid-operated	Delivery-quant. and breakaway char.
valve volt: 12,0	1 44 2050
2nd speed 1/min: 500	† 1st speed 1/min: 2950
TD travel mm: 1,64,0	+ KSB solenoid-operated
mm: -	+ valve volt: -
KSB solenoid-operated	+ Del.quantity_cm3/: 0,05,0
_valvevolt: 12,0	1000H.: (0,05,0)
3rd speed 1/min: 750	+ 2nd speed 1/min: 2650
TD travel mm: 1,62,4	+ KSB solenoid-operated
mm: (1,32,7)	+ valve volt: -
KSB solenoid-operated	+ Del.quantity cm3/: 8,016,0
valve volt: -	+ _ 1000H.: (7,017,0)
4th speed 1/min: 1250	+ 3rd speed 1/min: 2450
TD travel mm: 3,84,2	+ KSB solenoid-operated
mm: (3,34,7)	+ valve volt: -
KSB solenoid-operated	+ Del.quantity cm3/: 24,030,0
valve volt: -	+ 1000H.: (23,031,0)
5th speed 1/min: 2000	+ 4th speed 1/min: 2250
TD travel mm: 6,67,4	+ KSB solenoid-operated
mm: $(6,37,7)$	+ valve volt: -
KSB solenoid-operated	
valve volt: -	Del.quantity cm3/: 31,133,1 + 1000H.: (29,834,4)
6th speed 1/min: 2250	+ 5th speed 1/min: 2000
TD travel mm: 7,68,4	+ KSB solenoid-operated
mm: (7,38,7)	+ valve volt: -
KSB solenoid-operated	+ Del.quantity cm3/: 30,532,5
valve volt: -	1000H.: (29,233,8)
70201	6th speed 1/min: 1625
Supply-pump pressure characteristic:	KSB solenoid-operated
outper parts pressure entiraceer (Sere.	+ valve volt: -
1st speed 1/min: 750	
Supply-pump	Del.quantity cm3/: 29,932,9 + 1000H.: (29,133,7)
pressure bar: 3,13,7	7th speed 1/min: 1250
KSB solenoid-operated	KSB solenoid-operated
valve volt: -	
2nd speed 1/min: 1250	
Supply-pump	bel.quantity cm3/: 31,532,5
	1000H.: (29,734,3)
pressure bar: 4,55,1 KSB solenoid-operated	+ 8th speed 1/min: 750
valve volt: ~	+ KSB solenoid-operated
	+ valve volt: -
3rd speed 1/min: 2250	Del.quantity cm3/: 30,233,2
Supply-pump -	1000H: (29,434,0)
pressure bar: 7,07,6	
KSB solenoid-operated	† Zero delivery (stop):
valve volt: -	†
Aranti ara manakita aka aranti	†
Overflow quantity at overflow valve:	+ Electr. shutoff:
A-b - 4 A L 1 750	†
1st speed 1/min: 750	+ Speed 1/min: 400
KSB solenoid-operated	+ ELAB volt: -
valve volt: -	+ Del.quantity_cm3/: 0,03,0
Oveflow : 4183	+ max. 1000H.: -
quantity cm3/10s: (2698)	†
2nd speed 1/min: 2250	† Idle delivery:
KSB solenoid-operated	<b>†</b>
valve volt: -	+ 1st speed 1/min: 400
	+

KSB solenoid-operated valve volt: -Del.quantity cm3/: 4,0...8,0 1000H.: (2,0...10,0) High Idle: Speed 1/min: 500 Del.quantity cm3/: 7,7...11,7 1000H.: (5,7...13,7) KSB-Solenod-operated Volt : -Automatic starting fuel delivery: 1st speed 1/min: 210 KSB solenoid-operated valve volt: -Del.quantity cm3/: -ind. 1000H: 45,0 2nd speed 1/min: 310 KSB solenoid-operated valve volt: -Del.quantity cm3/: -max. 1000H: 45,0 max. Shutoff electromagnet:

Cut-in

min. voltage : 10,0 Rated voltage : 12,0

# Mounting and assembly dimensions:

Designation

K mm : 3,2...3,4 KF mm : 5,3...5,7 MS mm : 1,1...1,5 SVS max. mm : 1,4

Remarks:

Note inst. in remarks column

Test sheet : WW 1,3 B Edition : 01.02.89

replaces

Calibrating oil : ISO 4113

Injection pump : VE 4/ 8F2450 L331 Type number : 0 460 484 021

Customer-specific information Customer : VOLKSWAGEN

Engine : 1.31 SAUGD., POLO

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer: 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

assembly : 1 688 901 000

Openina

pressure bar: 147...150

Test ini. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Start of delivery Prestroke mm : -(from BDC): -

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1500 Speed Setting value mm: 3.9...4.3

Supply-pump pressure:

1/min: 1500 Setting value bar: 5.4...6.0

Full-load del. w/out charge press.:

1/min: 1500 Speed

Del.quantity cm3/

1000H.: 22.5...23.5 cm3/: 2.5

Dispersion 1000H.: (3.0)

Low-idle speed regulation:

Speed 1/min: 425

Del.quantity cm3/ 1000H.: 9.5...11.5

Residual-Delivery Setting Speed 1/min: 575

Del.quantity cm3/

1000H.: 2.5...3.5

Full-load speed regulation:

Speed 1/min: 2600

Del.quantity cm3/

1000H: 9.0...13.0

Start:

1/min: 100 Speed Del.quantity cm3/1000H.: 32.0 mind

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000

TD travel mm: 1.6...2.4

mm: (1.3...2.7)

1/min: 1500 2nd speed

mm: 3.9...4.3 mm: (3.4...4.8) 1/min: 2200 TD travel

3rd speed

mm: 6.9...7.7 TD travel

mm: (6.6...8.0)

Supply-pump pressure characteristic:

1/min: 800 1st speed

Supply-pump

bar: 3.7...4.3 1/min: 1500 pressure 2nd speed

Supply-pump

bar: 5.4...6.0 1/min: 2450 pressure

3rd speed

Supply-pump

bar: 7.7...8.3 pressure

Overflow quantity at overflow valve:

1st speed 1/min: 800

: 41...83 cm3/10s: (26...98) 1/min: 2450 Oveflow quantity 2nd speed Overflow : 55...138 quantity cm3/10s: (40...153) Delivery-quant. and breakaway char.: 1st speed 1/min: 2800 Del.quantity cm3/: 0.0...6.0 1000H.: -2nd speed 1/min: 2600
Del.quantity cm3/: 9.0...13.0
1000H.: (7.0...15.0)
3rd speed 1/min: 2550
Del.quantity cm3/: 10.5...20.5
1000H.: (9.5...21.5) 4th speed 1/min: 2450 Del.quantity cm3/: 21.0..23.0 1000H.: (19.8...24.2) 5th speed 1/min: 1500 Del.quantity cm3/: 22.5...23.5 1000H.: (20.8...25.2) 6th speed 1/min: 800 Del.quantity cm3/: 18.5...21.5 1000H.: (17.0...23.0) 7th speed 1/min: 600 Del.quantity cm3/: 15.0...20.0 1000H.: (12.5...22.5) Zero delivery (stop): Electr. shutoff: Speed 1/min: 450 ELAB volt: -Del.quantity cm3/: 0.0...3.0 max. 1000H.: -Idle delivery: 1st speed 1/min: 425 Del.quantity cm3/: 9.5...11.5 1000H.: (6.5...14.5) 2nd speed 1/min: 450 Del.quantity cm3/: 5.5...8.5 1000H.: (3.0...11.0) Residual: 1/min: 525 : 3.0...5.0 Speed Del.quantity 1000H.: (1.5...5.5) Automatic starting fuel delivery: 1st speed 1/min: 200 Del.quantity cm3/: -1000H: 30.0 ind.

F03

2nd speed 1/min: 400 Del.quantity cm3/: - max. 1000H: 30.0

Shutoff electromagnet:

Cut-in

min. voltage : 10.0 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm : 3.2...3.4 KF mm : -MS mm : 1.2...1.6

Remarks:

Note inst. in remarks column

Test sheet : VWW 2,4 S6 Edition : 03.02.89

replaces

Calibrating oil

: ISO 4113

Injection pump

: VE 5/ 8F2200 L336

: 0 460 485 001 Type number

Customer-specific information

Customer

: AUDI

Engine

: 153-2.4L

Power

k: 60.0

Speed

1/mi: 4400

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 000 assembly

Opening |

bar: 147...150 pressure

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 x Length mm: 840

Start of delivery Prestroke mm : -(from BDC) = -

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250 Setting value mm: 2.7...3.1

KSB solenoid-operated

volt: 12.0

Supply-pump pressure:

Speed 1/min: 1250 Setting value bar: 5.7...6.3

KSB solenoid-operated valve volt: 12.0

Full-load del. w/out charge press.:

Speed 1/min: 1250

Del.quantity cm3/ 1000H.: 35.0...36.0

KSB solenoid-operated volt: 12.0 cm3/: 2.0 valve Dispersion 1000H .: -

Low-idle speed regulation:

1/min: 415

Del.quantity cm3/ 1000H.: 7.0...9.0

KSB solenoid-operated volt: 12.0 cm3/: 2.0 valve Dispersion 1000H.: (3.0)

Residual-Delivery Setting 1/min: 540 Speed

Del.quantity cm3/ 1000H.: 2.0...3.0

KSB-Solenoid-Operated valve Volt : 12.0

Full-load speed regulation:

Speed 1/min: 2525

Del.quantity cm3/ 1000H: 10.0...14.0

KSB solenoid-operated valve volt: 12.0

Start:

1/min: 100 Speed Del.quantity cm3/1000H.: 35.0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed

1/min: 500 mm: 2.3...2.7 mm: (1.5...3.5) TD travel

KSB solenoid-operated valve volt: -2nd speed 1/min: 750

TD travel mm: 0.6...1.4

mm: (0.3...1.7)

KSB solenoid-operated	+	Del.quantity cm3/: 10.014.0
valve volt: 12.0	+	1000H.: (8.016.0)
3rd speed 1/min: 1250	+	3rd speed 1/min: 2425
TD travel mm: 2.73.1	+	KSB solenoid-operated
mm: (2.23.6)	+	valve volt: 12.0
KSB solenoid-operated	+	Del.quantity cm3/: 18.028.0 1000H.: (17.029.0)
valve volt: 12.0 4th speed 1/min: 2000 TD travel mm: 5.96.7	+++++++++++++++++++++++++++++++++++++++	1000H.: (17.029.0)
4th speed 1/min: 2000	1	4th speed 1/min: 2200
TD travel mm: 5.96.7	1	KSB solenoid-operated
mm: (5.67.0)	1	valve volt: 12.0
KSB solenoid-operated	1	Del.quantity cm3/: 29.231.2
valve volt: 12.0	$\mathbf{I}$	1000H.: (28.032.4)
70cc. 12.0	T	5th speed 1/min: 1250
Supply-pump pressure characteristic:	T	KSB solenoid-operated
supply pump pressure that acter is tit.	T	Nob solehold operated
1st speed 1/min: 500	T	valve volt: 12.0 Del.quantity cm3/: 35.036.0
	†	ver.quantity cms/: 35.U36.U
Supply-pump	†	1000H.: (33.237.7)
pressure bar: 5.16.3	. 🕇 🗆	6th speed 1/min: 750
KSB solenoid-operated	+	KSB solenoid-operated
valve volt: -	+	valve volt: 12.0
2nd speed 1/min: 750	+	Del.quantity cm3/: 30.333.7
Supply-pump	<del>+-+-+-</del> +-+-	1000H.: (29.235.2
pressure bar: 4.65.2	+	7th speed 1/min: 500
KSB solenoid-operated	+	KSB solenoid-operated
valve volt: 12.0	+	valve volt: 12.0
3rd speed 1/min: 1250	+	Del.quantity cm3/: 29.534.5
Supply-pump	1	1000H.: (27.037.0)
pressure bar: 5,76,3	1	10001111 (27.01.137.07
KSB solenoid-operated	1	Zero delivery (stop):
The second of th		zero decivery (stop).
Valve Volt: 12 II	-1-	
valve volt: 12.0	+	
4th speed 1/min: 2200	‡	
4th speed 1/min: 2200 Supply-pump	+	Electr. shutoff:
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3	+++++++++++++++++++++++++++++++++++++++	
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5)	+++++++++++++++++++++++++++++++++++++++	Speed 1/min: 415
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5) KSB solenoid-operated	† † † † †	Speed 1/min: 415 ELAB volt: -
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5)	+++++++	Speed 1/min: 415 ELAB volt: - Del.quantity cm3/: 0.03.0
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5) KSB solenoid-operated valve volt: 12.0	*++ * * * * * * * * * * * * * * * * * *	Speed 1/min: 415 ELAB volt: -
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5) KSB solenoid-operated	++++++++++	Speed 1/min: 415 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5) KSB solenoid-operated valve volt: 12.0 Overflow quantity at overflow valve:	<del>+++++++++++++++++++++++++++++++++++++</del>	Speed 1/min: 415 ELAB volt: - Del.quantity cm3/: 0.03.0
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5) KSB solenoid-operated valve volt: 12.0  Overflow quantity at overflow valve:  1st speed 1/min: 759	<del>+++++++++++++++++++++++++++++++++++++</del>	Speed 1/min: 415 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5) KSB solenoid-operated valve volt: 12.0  Overflow quantity at overflow valve:  1st speed 1/min: 750 KSB solenoid-operated	<del></del>	Speed 1/min: 415 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5) KSB solenoid-operated valve volt: 12.0  Overflow quantity at overflow valve:  1st speed 1/min: 750 KSB solenoid-operated valve volt: 12.0	<del>┤╌╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏</del>	Speed 1/min: 415 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery: 1st speed 1/min: 365
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5) KSB solenoid-operated valve volt: 12.0  Overflow quantity at overflow valve:  1st speed 1/min: 750 KSB solenoid-operated valve volt: 12.0	<del>┤╌╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈</del>	Speed 1/min: 415 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery: 1st speed 1/min: 365 KSB solenoid-operated
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5) KSB solenoid-operated valve volt: 12.0  Overflow quantity at overflow valve:  1st speed 1/min: 750 KSB solenoid-operated valve volt: 12.0  Overflow : 4183	<del>┤╌╏╌╏╌╏╌╏┈╏╸╏╶╏</del> ╌╏╌╏╾╏╾╏╾╏	Speed 1/min: 415 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery: 1st speed 1/min: 365 KSB solenoid-operated valve volt: 12.0
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5) KSB solenoid-operated valve volt: 12.0  Overflow quantity at overflow valve:  1st speed 1/min: 750 KSB solenoid-operated valve volt: 12.0  Oveflow : 4183 quantity cm3/10s: (2698)	┽╌╂╌╂╌╂╌╂╌╂╌╂┈╂╌╂╌╂╌╂╾╂ <del>╌╏</del> ╌╂╼╂╾╂╌╂╌╂	Speed 1/min: 415 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 365 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 14.517.5
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5) KSB solenoid-operated valve volt: 12.0  Overflow quantity at overflow valve:  1st speed 1/min: 750 KSB solenoid-operated valve volt: 12.0  Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 2200	┽╌╂╌╂╌╂╌╂┈╏╌ <i>╂╶╂┈╂╾╂╾╂╾╂╾╂╾╂╾╂╾╂╌╂╾╂</i>	Speed 1/min: 415 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 365 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 14.517.5 1000H.: (12.020.0)
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5) KSB solenoid-operated valve volt: 12.0  Overflow quantity at overflow valve:  1st speed 1/min: 750 KSB solenoid-operated valve volt: 12.0  Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 2200 KSB solenoid-operated	┽╌╂╌╉╌╉╌╂┈╏╌╏╶╏╴┪╌┧╼╂╼╂ <i>╾╂╼╂╼╂╾╂╾╂╾╂╾╂╾</i>	Speed 1/min: 415 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 365 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 14.517.5 1000H.: (12.020.0) 2nd speed 1/min: 415
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5) KSB solenoid-operated valve volt: 12.0  Overflow quantity at overflow valve:  1st speed 1/min: 759 KSB solenoid-operated valve volt: 12.0  Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 2200 KSB solenoid-operated valve volt: 12.0	┽╌╂╌╉╌╉╌╏╌╏╌╏╶┨╴┧╌╽╼╂╾╏ <b>╌╏╌╏╌╏╌╏╌╏╌╏╌╏</b>	Speed 1/min: 415 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 365 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 14.517.5 1000H.: (12.020.0) 2nd speed 1/min: 415 KSB solenoid-operated
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5) KSB solenoid-operated valve volt: 12.0  Overflow quantity at overflow valve:  1st speed 1/min: 759 KSB solenoid-operated valve volt: 12.0  Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 2200 KSB solenoid-operated valve volt: 12.0  Overflow : 55138	<del>┤╌╏╌╏╌╏╌╏╌╏╶╏┈╏╌╏╌╏┈╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸</del>	Speed 1/min: 415 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 365 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 14.517.5 1000H.: (12.020.0) 2nd speed 1/min: 415 KSB solenoid-operated
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5) KSB solenoid-operated valve volt: 12.0  Overflow quantity at overflow valve:  1st speed 1/min: 759 KSB solenoid-operated valve volt: 12.0  Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 2200 KSB solenoid-operated valve volt: 12.0	┽╌╂╌╉╌╉ <b>╌</b> ╂╌╂╌╂╶╉╌╉╼╂╾╂╾╂╾╂╾╂╾╂╾╂╾╂╾╂╾╂╾╂╾╂╌╂╌╂╌	Speed 1/min: 415 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 365 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 14.517.5 1000H.: (12.020.0)  2nd speed 1/min: 415 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 7.09.0
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5)  KSB solenoid-operated valve volt: 12.0  Overflow quantity at overflow valve:  1st speed 1/min: 750  KSB solenoid-operated valve volt: 12.0  Oveflow : 4183 quantity cm3/10s: (2698)  2nd speed 1/min: 2200  KSB solenoid-operated valve volt: 12.0  Overflow : 55138 quantity cm3/10s: (40153)	┽╌╂╌╉╌╉╌╂╌╂╌╂╌╂╌╉╌╉╼╂╾╂╾╂ <b>╌╂</b> ╌╂╌╂╌╂╌╂╌╂╌╂╌╂╌╂	Speed 1/min: 415 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 365 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 14.517.5 1000H.: (12.020.0) 2nd speed 1/min: 415 KSB solenoid-operated
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5) KSB solenoid-operated valve volt: 12.0  Overflow quantity at overflow valve:  1st speed 1/min: 759 KSB solenoid-operated valve volt: 12.0  Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 2200 KSB solenoid-operated valve volt: 12.0  Overflow : 55138	┽╌╂╌╉╌╂┈╂╌╂╌╂╌╂╌╉╌╉╼╂╾╂╾╂ <b>╌╂</b> ╌╂╌╂╌╂╌╂╌╂╌╂╌╂╌╂╌╂╌╂	Speed 1/min: 415 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 365 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 14.517.5 1000H.: (12.020.0) 2nd speed 1/min: 415 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 7.09.0 1000H.: (4.012.0)
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5)  KSB solenoid-operated valve volt: 12.0  Overflow quantity at overflow valve:  1st speed 1/min: 750 KSB solenoid-operated valve volt: 12.0  Oveflow : 4183 quantity cm3/10s: (2698)  2nd speed 1/min: 2200 KSB solenoid-operated valve volt: 12.0  Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:	┽╌╂╌╉╌╉╌╏╌╏╌╏╌╏╌┫╌┫╼╂ <b>╾╏╌╏╌╏╌╏╌╏╌╏╌╏╌╏╌╏╌╏╌╏╌</b>	Speed 1/min: 415 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 365 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 14.517.5 1000H.: (12.020.0)  2nd speed 1/min: 415 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 7.09.0
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5)  KSB solenoid-operated valve volt: 12.0  Overflow quantity at overflow valve:  1st speed 1/min: 750 KSB solenoid-operated valve volt: 12.0  Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 2200 KSB solenoid-operated valve volt: 12.0  Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 2700	┽╌╂╌╉╌╉╍╂╍╂╌╂╌╂╌╉╾╉╼╂ <b>╾╂╾╂╌╂╌╂╌</b> ╂╾╂╼╂┄╂╌╂ <del>╸╏╸╏</del> ╌╂╌╂╼╂╼┠╾╏╌╂	Speed 1/min: 415 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 365 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 14.517.5 1000H.: (12.020.0) 2nd speed 1/min: 415 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 7.09.0 1000H.: (4.012.0)  Residual:
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5) KSB solenoid-operated valve volt: 12.0  Overflow quantity at overflow valve:  1st speed 1/min: 750 KSB solenoid-operated valve volt: 12.0  Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 2200 KSB solenoid-operated valve volt: 12.0  Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 2700 KSB solenoid-operated KSB solenoid-operated	┽╌╂╌╉╌╉╌╏╌╏╌╏╌╏╌╏╌┫╌╉ <b>╌╏╌╏╌╏╌╏╌╏╌╏╌╏╌╏╌╏╌╏╌╏╌╏╌╏╌╏╌╏╌╏╌╏</b>	Speed 1/min: 415 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 365 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 14.517.5 1000H.: (12.020.0) 2nd speed 1/min: 415 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 7.09.0 1000H.: (4.012.0)  Residual:  Speed 1/min: 490
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5)  KSB solenoid-operated valve volt: 12.0  Overflow quantity at overflow valve:  1st speed 1/min: 750 KSB solenoid-operated valve volt: 12.0  Oveflow : 4183 quantity cm3/10s: (2698)  2nd speed 1/min: 2200 KSB solenoid-operated valve volt: 12.0  Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 2700 KSB solenoid-operated valve volt: 12.0	┽╌╂╌╉╌╉╍╂╍╂╌╂╌╂╌╉╾╉╼╂ <b>╾╂╸╂╸╂</b> ╌╂╌╂╼╂╼╂╌╂╌╂╼╂╼╂╼┼╼┼╼┼╌╂╌╂╾	Speed 1/min: 415 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 365 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 14.517.5 1000H.: (12.020.0)  2nd speed 1/min: 415 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 7.09.0 1000H.: (4.012.0)  Residual:  Speed 1/min: 490 Del.quantity : 2.54.5
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5)  KSB solenoid-operated valve volt: 12.0  Overflow quantity at overflow valve:  1st speed 1/min: 750 KSB solenoid-operated valve volt: 12.0  Oveflow : 4183 quantity cm3/10s: (2698)  2nd speed 1/min: 2200 KSB solenoid-operated valve volt: 12.0  Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 2700 KSB solenoid-operated valve volt: 12.0  Delivery-quantity cm3/: 0.06.0	┽╌╂╌╉╍╂╍╂╌╂╌╂╌╉╌╉╼╉╼╂ <b>╾╂╸╂╸╂</b> ╌╂╌╂╼╂╼╂╌╂╌╂╼╂╼┼╼┼╼┼╼┼╌╂╌╂╼╃	Speed 1/min: 415 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 365 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 14.517.5 1000H.: (12.020.0)  2nd speed 1/min: 415 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 7.09.0 1000H.: (4.012.0)  Residual:  Speed 1/min: 490 Del.quantity : 2.54.5 1000H.: (1.06.0)
Ath speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5)  KSB solenoid-operated valve volt: 12.0  Overflow quantity at overflow valve:  1st speed 1/min: 750 KSB solenoid-operated valve volt: 12.0  Oveflow : 4183 quantity cm3/10s: (2698)  2nd speed 1/min: 2200 KSB solenoid-operated valve volt: 12.0  Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 2700 KSB solenoid-operated valve volt: 12.0  Delivery-quant. 2700  Delivery-quant. 2700  Delivery-quantity cm3/: 0.06.0  1000H.: -	┽╌╂╌╉╌╉╍╏╍╂╌╂╌╂╌╉╾╉╼╂ <b>╾╂╌╂╌╂╌╂╌╂╌╂╌╂╌╂╌╂╌╂╌╂╌┼╌┼╌╂╌╀╌╀╌╀╌╀╌</b>	Speed 1/min: 415 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 365 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 14.517.5 1000H.: (12.020.0)  2nd speed 1/min: 415 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 7.09.0 1000H.: (4.012.0)  Residual:  Speed 1/min: 490 Del.quantity : 2.54.5 1000H.: (1.06.0)
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5)  KSB solenoid-operated valve volt: 12.0  Overflow quantity at overflow valve:  1st speed 1/min: 750 KSB solenoid-operated valve volt: 12.0  Oveflow : 4183 quantity cm3/10s: (2698)  2nd speed 1/min: 2200 KSB solenoid-operated valve volt: 12.0  Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 2700 KSB solenoid-operated valve volt: 12.0  Delivery-quantity cm3/: 0.06.0	┽╌╂╌╉╌╉╍╏╌╂╌╂╌╂╌╉╾╉╼╂ <i>╾╂╸╂╸╂</i> ╶╂╌╂╼╂╼╂╸╂╸╂╼╂╼╂╼┞╼╏╼╂╌╂╌╂╌╃ <i>╾</i> ╀╌┇	Speed 1/min: 415 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 365 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 14.517.5 1000H.: (12.020.0)  2nd speed 1/min: 415 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 7.09.0 1000H.: (4.012.0)  Residual:  Speed 1/min: 490 Del.quantity : 2.54.5 1000H.: (1.06.0) KSB-Solenoid-operated
4th speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5) KSB solenoid-operated valve volt: 12.0  Overflow quantity at overflow valve:  1st speed 1/min: 750 KSB solenoid-operated valve volt: 12.0  Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 2200 KSB solenoid-operated valve volt: 12.0  Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 2700 KSB solenoid-operated valve volt: 12.0  Delivery-quant. 2700 CKSB solenoid-operated valve volt: 12.0  Deliquantity cm3/: 0.06.0  1000H.: - 2nd speed 1/min: 2525	┽╌╂╌╉╍╂╍╂╌╂╌╂╌╉╾╉╼╋╼╂ <b>╾╂╌╂╌╂╌╂╌╂╼╂╼╂╸╂╸╂</b> ╌╂ <del>╸╏╸╏╸╏</del> ╌╏╌╂╌╂╌╂╌╂╌╂╌╂╌╂╌╂	Speed 1/min: 415 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 365 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 14.517.5 1000H.: (12.020.0)  2nd speed 1/min: 415 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 7.09.0 1000H.: (4.012.0)  Residual:  Speed 1/min: 490 Del.quantity : 2.54.5 1000H.: (1.06.0)
Ath speed 1/min: 2200 Supply-pump pressure bar: 7.78.3 bar: (7.58.5)  KSB solenoid-operated valve volt: 12.0  Overflow quantity at overflow valve:  1st speed 1/min: 750 KSB solenoid-operated valve volt: 12.0  Oveflow : 4183 quantity cm3/10s: (2698)  2nd speed 1/min: 2200 KSB solenoid-operated valve volt: 12.0  Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 2700 KSB solenoid-operated valve volt: 12.0  Delivery-quant. 2700  Delivery-quant. 2700  Delivery-quantity cm3/: 0.06.0  1000H.: -	┽╌╂╌╉╍╂╍╏╌╏╌╏╌┨╌┫╼╂╼╂ <i>╾╂╸╂╸╂╸╂╸╂╸╂╸╂╸╂╸╂╸╂</i> ╶╾╏╼╏╌╏╌╏╌╂╶╃╶╂╌╏┄╂╾╂	Speed 1/min: 415 ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 365 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 14.517.5 1000H.: (12.020.0)  2nd speed 1/min: 415 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: 7.09.0 1000H.: (4.012.0)  Residual:  Speed 1/min: 490 Del.quantity : 2.54.5 1000H.: (1.06.0) KSB-Solenoid-operated

1st speed 1/min: 180 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: ind. 1000H: 35.0

2nd speed 1/min: 380 KSB solenoid-operated valve volt: 12.0 Del.quantity cm3/: max. 1000H: 40.0

# Shutoff electromagnet:

Cut-in

min. voltage : 10.0 Rated voltage : 12.0

# Mounting and assembly dimensions:

Designation

K mm : 3.1...3.5
KF mm : K-OT
MS mm : 1.2...1.6
SVS max. mm : -

Remarks:

Note inst. in remarks column

Test sheet : FIA 1,7 P5 Edition : 16.01.89

replaces

Calibrating oil : ISO 4113

: VE 4/ 9F2100 R343 Injection pump : D 460 494 246 Type number

Customer-specific information Customer : FIAT-AUTO

Engine : M710 DT 19 D

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0,35

Calibrating nozzle-holder

assembly : 1 688 901 022

**Opening** 

bar: 130...133 pressure

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 mm: 450 x Length

Injection pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500 Charge press. hPa: 1000 Setting value mm: 5,5...5,9 KSB solenoid-operated volt: 12,0

Supply-pump pressure:

Speed 1/min: 1500 Charge press. hPa: 1000 Setting value bar: 5,3...5,9 KSB solenoid-operated valve volt: 12.0

Full-load del. with charge press.:

Speed 1/min: 1500 Charge press. hPa: 1000 Del.quantity cm3/ 1000H.: 52,0...53,0

KSB solenoid-operated volt : 12,0 cm3/ : 2,5 valve Dispersion 1000H : (2,5)

Full-load del. w/out charge press.:

1/min: 600 Speed Del.quantity cm3/ 1000H.: 40,0...41,0

KSB solenoid-operated valve volt: 12.0

Low-idle speed regulation:

Speed 1/min: 400 Del.quantity cm3/ 1000H.: 11,0...15,0

KSB solenoid-operated volt: 12.0 cm3/: 2.5 1000H.: (2,5) valve Dispersion

Residual-Delivery Setting 1/min: 700 Speed

Del.quantity cm3/

1000H.: 4,0...6,0

KSB-Solenoid-Operated valve Volt : 12.0

Full-load speed regulation:

1/min: 2300 Speed Charge press. hPa: 1000

Del.quantity cm3/

1000H: 30,0...36,0

KSB solenoid-operated valve volt: 12.0

Start:

Speed 1/min: 100 Del.quantity cm3/1000H.: 55,0 mind KSB solenoid-operated valve volt: 12,0

Load-dependent start of delivery:

Speed 1/min: 1500

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

	_	
	+	Oveflow : 4183
A	+	quantity cm3/10s: (2698)
1st speed 1/min: 500	+	2nd speed 1/min: 2100
Charge press. hPa: 1000	+	Charge press. hPa: 1000
TD travel mm: 3,24,8	+	KSB solenoid-operated
mm: (2,55,5)	+	valve volt: 12,0
KSB solenoid-operated	+	Overflow : 55138
valve volt: -	+	quantity cm3/10s: (40153)
2nd speed 1/min: 1000	+	
Charge press. hPa: 1000	+	Delivery-quant. and breakaway char.:
TD travel mm: 2,55,5	†	
mm: (2,55,5)	+	1st speed 1/min: 800
KSB solenoid-operated	+	Charge-air pressure-setting
valve volt: -	+	point hPa: 400
3rd speed 1/min: 800	+	KSB solenoid-operated
Charge press. hPa: 1000	+	valve volt: 12,0
TD travel mm: 1,82,6	+	Del.quantity_cm3/: 43,544,5
mm: (1,52,9)	+	1000H.: (41,546,5)
KSB solenoid-operated	+	2nd speed 1/min: 2650
valve volt: 12,0	+	Charge press. hPa: 1000
4th speed 1/min: 1500	+	KSB solenoid-operated
Charge press. hPa: 1000	+	valve volt: 12,0
TD travel mm: 5,55,9	+	Del.quantity cm3/: 0,07,0
mm: (5,26,2)	+	1000H.: -
KSB solenoid-operated	+	3rd speed 1/min: 2450
valve volt: 12,0	+	Charge press. hPa: 1000
5th speed 1/min: 2100	+	KSB solenoid-operated
Charge press. hPa: 1000	+	valve volt: 12,0
TD travel mm: 8,29,0	+	Del.quantity cm3/: 12,020,0
mm: (7,99,3)	+	1000H.: (11,021,0)
KSB solenoid-operated	+	4th speed 1/min: 2300
valve volt: 12,0	+	Charge press. hPa: 1000
	+	KSB solenoid-operated
Supply-pump pressure characteristic:	+	valve volt: 12,0
A-t	+	Del.quantity cm3/: 30,036,0
1st speed 1/min: 800	+	1000H.: (29,037,0)
Charge press. hPa: 1000	+	5th speed 1/min: 2100
Supply-pump	+	Charge press. hPa: 1000
pressure bar: 3,23,8	+	KSB solenoid-operated
KSB solenoid-operated	†	valve volt: 12,0
valve volt: 12,0	+	Del.quantity_cm3/: 50,553,5
2nd speed 1/min: 1500	t	1000H.: (49,554,5)
Charge press. hPa: 1000	+	6th speed 1/min: 1500
Supply-pump	†	Charge press. hPa: 1000
pressure bar: 5,35,9	†	KSB solenoid-operated
KSB solenoid-operated	+	valve volt: 12,0
valve volt: 12,0	+	Del.quantity_cm3/: 52,053,0
3rd speed 1/min: 2100	+	1000H.: (50,554,5)
Charge press. hPa: 1000	+	7th speed 1/min: 800
Supply-pump hart 7.0 7.4	+	Charge press. hPa: 1000
pressure bar: 7,07,6	Ť	KSB solenoid-operated
KSB solenoid-operated	†	valve volt: 12,0
valve volt: 12,0	<b>†</b>	Del.quantity_cm3/: 55,558,5
Aconflore grandity of aconflore column	†	1000H.: -
Overflow quantity at overflow valve:	†	8th speed 1/min: 800
1st speed 1/min. 800	Ť	Charge press. hPa: 400
1st speed 1/min: 800	Ť	KSB solenoid-operated
Charge press. hPa: 1000	T	valve volt: 12,0
KSB solenoid-operated valve volt: 12,0	T	Del.quantity cm3/: 43,544,5
valve volt: 12,0	T	1000H: (41,546,5)

9th speed 1/min: 800 KSB solenoid-operated volt: 12,0 valve cm3/: 37/0...39/0 1000H: (35/5...40/5) Del.quantity 1/min: 600 10th speed KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 40,0...41,0 1000H: (38,0...43,0) Zero delivery (stop): Electr. shutoff: Speed 1/min: 400 ELA8 volt: -Del.quantity cm3/: 0,0...3,0 max. 1000H.: -Idle delivery: 1/min: 400 1st speed KSB solenoid operated volt: 12,0 valve Del.quantity cm3/: 11,0..15,0 1000H.: (9,5...16,5) Residual: 1/min: 500 Speed Del.quantity 1000H.: -Speed : 4,8...7,8 KSB-Solenoid-operated valve Volt: 12,0 Automatic starting fuel delivery: 1st speed 1/min: 220 KSB solenoid-operated volt: 12,0 valve Del.quantity cm3/: -ind. 1000H: 57,0 2nd speed 1/min: 300 KSB solenoid-operated volt: 12,0 valve Del.quantity cm3/: -max. 1000H: 48,0 Shutoff electromagnet: Cut-in min. voltage : 10,0 : 12.0 Rated voltage Mounting and assembly dimensions: Designation

E09

K mm : 3,2...3,4 KF mm : 5,6...6,0 MS mm : 1,0...1,4

Remarks:

Correction at adjusting nut (46)

Unscrew KSB ball valve 2 mm

Note inst. in remarks column

: REN 2,0 01 Test sheet Edition : 01.02.89

replaces

Calibrating oil : ISO 4113

Injection pump : VE 4/ 9F2350 R309-1

Type number : 0 460 494 247

Customer-specific information Customer : RNUR

Engine : J8S - 740

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer: 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

assembly : 1 688 901 022

Opening |

pressure bar : 0.35

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 x Length

Start of delivery Prestroke mm : -(from BDC): -

Injection-pump setting values Test specifications in parentheses

Timing device travel:

1/min: 1125 Speed Setting value mm: 2.6...3.0

Supply-pump pressure:

1/min: 1125 Setting value bar: 4.2...4.8

Full-load del. w/out charge press.:

Speed 1/min: 1125

Del.quantity cm3/ 1000H.: 36.5...37.5 Dispersion cm3/: 2.5

1000H.: (3.0)

Low-idle speed regulation:

Speed 1/min: 400

Speed
Del.quantity cm3/
1000H.: 6,0...10,0
Dispersion cm3/: 2,5
1000H.: (3,0)

Residual-Delivery Setting Speed 1/min: 500

Del.quantity cm3/

1000H.: 1,0...5,0

Full-load speed regulation:

Speed 1/min: 2500

Del.quantity cm3/

1000H: 20.0...26.0

Start:

Speed 1/min: 100 Del.quantity cm3/1000H.: 52.0 mind

Load-dependent start of delivery:

Speed 1/min: 1125

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800 TD travel

mm: 0.7...1.5 mm: (0.4...1.8)

2nd speed 1/min: 1125

TD travel mm: 2.6...3.0 mm: (2.1...3.5)

1/min: 2000 3rd speed TD travel

mm: 6.9...7.7 mm: (6.6...8.0)

Supply-pump pressure characteristic:

1st speed 1/min: 800

Supply-pump

bar: 3.1...3.7 1/min: 1125 pressure 2nd speed

Supply-pump

bar: 4.2...4.8 pressure

1/min: 2000 3rd speed

E10

Supply-pump bar: 6.5...7.1 pressure Overflow quantity at overflow valve: 1st speed 1/min: 800 Oveflow : 41...83 cm3/10s: (26...98) quantity 1/min: 2250 : 55...138 2nd speed Overflow quantity cm3/10s: (40...153) Delivery-quant. and breakaway char.: 1/min: 2750 1st speed Del.quantity cm3/: 0.0...5.0 1000H.: -2nd speed 1/min: 2650
Del.quantity cm3/: 2.0...10.0
1000H.: (1.0...11.0)
3rd speed 1/min: 2250
Del.quantity cm3/: 34.3...36.3
1000H.: (33.0...37.6) 1/min: 1750 4th speed Del.quantity cm3/: 34.0...36.0 1000H.: (32.7...37.3) 5th speed 1/min: 1125 Del.quantity cm3/: 36.5...37.5 1000H.: (34.7...39.3) 6th speed 1/min: 800 Del.quantity cm3/: 33.5...36.5 1000H.: (32.7...37.3) Zero delivery (stop): Electr. shutoff: Speed 1/min: 400 ELAB volt: -Del.quantity cm3/: 0.0...3.0 max. 1000H.: -Idle delivery: 1/min: 400 1st speed Del.quantity cm3/: 6,0...10,0 1000H.: (4,0...12,0) High Idle: Speed 1/min: 500 Del.quantity cm3/: 7,7...11,7 1000H.: (5,7...13,7) Residual: Speed Del.quantity 1000H.: -Speed 1/min: 500 : 1,0...5,0

Automatic starting fuel delivery:

1st speed 1/min: 210 Del.quantity cm3/: ind. 1000H: 45.0

2nd speed 1/min: 310 Del.quantity cm3/: - max. 1000H: 45.0

Shutoff electromagnet:

Cut-in

min. voltage : 10.0 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm : 3.2...3.4 KF mm : 5.3...5.7 MS mm : 1.3...1.7 SVS max. mm : 2.3

Remarks:

Note inst. in remarks column

Test sheet : REN 2,0 02 Edition : 01.02.89

replaces

Calibrating oil : ISO 4113

Injection pump : VE 4/ 9F2350 R309-2

: 0 460 494 251 Type number

Customer-specific information

Customer : RNUR

: J8S-736 , 740 Engine

TEST BENCH REQUIREMENTS

Calibrating oil return temp. °C

with thermometer: 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

assembly : 1 688 901 022

Opening |

bar: 130...133 pressure

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 x Length mm: 450

Start of delivery Prestroke mm : -(from BDC): -

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1125 Setting value mm: 2.6...3.0

Supply-pump pressure:

1/min: 1125 Setting value bar: 4.2...4.8

Full-load del. w/out charge press.:

Speed 1/min : 1125

Del.quantity cm3/

1000H.: 36.5...37.5 cm3/: 2.5

Dispersion

1000H.: (3.0)

Low-idle speed regulation:

Speed 1/min: 400

Del.quantity cm3/ 1000H.: 6.0...10.0 Dispersion cm3/: 2.5 1000H.: (3.0) Residual-Delivery Setting Speed 1/min: 500

Del.quantity cm3/ 1000H.: 1.0...5.0

Full-load speed regulation:

1/min: 2500 Speed

Del.quantity cm3/

1000H: 20.0...26.0

Start:

1/min: 100 Speed Del.quantity mind cm3/1000H.: 52.0

Load-dependent start of delivery:

Speed 1/min: 1125

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800

mm: 0.7...1.5 mm: (0.4...1.8) TD travel

1/min: 1125 2nd speed

TD travel mm: 2.6...3.0 mm: (2.1...3.5)

1/min: 2000 3rd speed

mm: 6.9...7.7 mm: (6.6...8.0) TD travel

Supply-pump pressure characteristic:

1/min: 800 1st speed

Supply-pump

bar: 3.1...3.7 pressure 1/min: 1125 2nd speed

Supply-pump

pressure bar: 4.2...4.8

1/min: 2000 3rd speed

Supply-pump bar: 6.5...7.1 pressure Overflow quantity at overflow valve: 1st speed 1/min: 800 Oveflow : 41...83 quantity cm3/10s: (26...98) 2nd speed 1/min: 2250 2nd speed : 55...138 Overflow quantity cm3/10s: (40...153) Delivery-quant. and breakaway char.: 1st speed 1/min: 2750 Del.quantity cm3/: 0.0...5.0 1000H.: -2nd speed 1/min: 2650
Del.quantity cm3/: 2.0...10.0
1000H.: (1.0...11.0)
3rd speed 1/min: 2250
Del.quantity cm3/: 34.3...36.3
1000H.: (33.0...37.6) 4th speed 1/min: 1750 Del.quantity cm3/: 34.0...36.0 1000H.: (32.7...37.3) 5th speed 1/min: 1125 Del.quantity cm3/: 36.5...37.5 1000H.: (34.7...39.3) 6th speed 1/min: 800
Del.quantity cm3/: 33.5...36.5
1000H.: (32.7...37.3) Zero delivery (stop): Electr. shutoff: Speed 1/min: 400 ELAB voit: -Del.quantity cm3/: 0.0...3.0 max. 1000H.: -Idle delivery: 1st speed 1/min: 400 Del.quantity cm3/: 6.0...10.0 1000H.: (4.0...12.0) High Idle: Speed 1/min: 500 Del.quantity cm3/: 7.7...11.7 1000H.: (5.7...13.7)

Automatic starting fuel delivery:

1st speed 1/min: 210 Del.quantity cm3/: ind. 1000H: 45.0

2nd speed 1/min: 310 Del.quantity cm3/: - max. 1000H: 45.0

Shutoff electromagnet:

Cut-in

min. voltage : 10.0 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm : 3.2...3.4 KF mm : 5.3...5.7 MS mm : 1.3...1.7 SVS max. mm : 2.3

Remarks:

Residual:

Del.quantity

Speed

1/min: 500

: 1.0...5.0

Note inst. in remarks column

: VW 2,0 K1 : 3.3.89 : 16.1.89 Test sheet Edition replaces Calibrating oil : ISO 4113

Injection pump : VE 5/ 9F2250 L245 : 0 460 495 001 Type number

Customer Part-No. :

Customer—specific information

Customer : VW

Engine : 153T-LLK

TEST BENCH REQUIREMENTS

Calibrating oil return temp. °C

with thermometer: 40...48 electronically : 42...50

Inlet press., bar: 0,35

Calibrating nozzle-holder

assembly : 1 688 901 000

Opening

bar: 147...150 pressure

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 x Length mm: 840

Start of delivery Prestroke mm : -(from BDC): -

Injection pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500 Charge press. hPa: 750 Setting value mm: 3,0...3,4 KSB solenoid-operated valve volt: 12.0

Supply-pump pressure:

1/min: 1500 Speed Charge press. hPa: 750 Setting value bar: 6,0...6,6 KSB solenoid-operated valve volt: 12,0

Full-load del. with charge press.:

Speed 1/min: 1500 Del.quantity cm3/ 1000H.: 42,7...43,7

KSB solenoid-operated volt : 12,0 cm3/ : 2,5 1000H : (3,0) valve Dispersion

Full-load del. w/out charge press.:

Speed 1/min: 700

Del.quantity cm3/ 1000H.: 27,0...28,0

KSB solenoid-operated valve volt: 12.0

Low-idle speed regulation:

1/min: 390

Del.quantity cm3/ 1000H.: 10,0...12,0

KSB solenoid-operated volt: 12,0 cm3/: 2,5 1000H.: (3,0) valve Dispersion

Residual-Delivery Setting Speed 1/min: 540

Del.quantity cm3/ 1000H.: 2,5...3,5

KSB-Solenoid-Operated Volt : 12,0 valve

Full-load speed regulation:

1/min: 2525 Speed Del.quantity cm3/

1000H: 16,0...20,0

KSB solenoid-operated valve volt: 12,0

Start:

1/min: 100 Speed Del.quantity : 37,0...48,0

mind cm3/1000H.: -KSB solenoid-operated volt: 12.0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

	+	KSB solenoid-operated
	+	valve volt: 12,0
1st speed 1/min: 500	+	Overflow : 55138
Charge press. hPa: 750	+	quantity cm3/10s: (40153)
TD travel mm: 2,32,7	1	quantity oner look (tollings)
mm: 1,53,5	1	Dalivamenumt and brankovsky shan .
2nd speed 1/min: 1000	T	Delivery-quant. and breakaway char.:
Change proces hose 750	Ť	4 4 4 6 6700
Charge press. hPa: 750	+	1st speed
TD travel mm: 0,81,6	+	Charge-air pressure-setting
mm: (0,51,9)	+	point hPa: 750
KSB solenoid operated	+	KSB solenoid-operated
valve volt: 12,0	+	valve volt: 12,0
3rd speed 1/min: 1500	+	Del.quantity cm3/: 0,06,0
Charge press. hPa: 750	1	1000H.: (0,06,0)
TD travel mm: 3,03,4	1	2nd speed 1/min: 2525
mn: (1,53,9)	T	
VCD colonoid propoted	T	Charge press. hPa: 750
KSB solenoid-operated	†	KSB solenoid-operated
valve volt: 12,0	+	valve volt: 12,0 Del.quantity cm3/: 16,020,0 1000H.: (14,022,0)
4th speed 1/min: 2250	+	Del.quantity cm3/: 16,020,0
Charge press. hPa: 750	+	1000H.: (14,022,0)
TD travel mm: 6,16,9	+	3rd speed 1/min: 2425
mm: (5,87.2)	+	Charge press. hPa: 750
KSB solenoid-operated	1	KSB solenoid-operated
valve volt: 12,0		valve valte 12 0
vacve voce. 12,0	T	valve volt: 12,0 Del.quantity cm3/: 25,535,5 1000H.: (24,536,5)
Complete many management of an advantage of	<b>T</b>	ver.quartity cms/: 25,555,5
Supply-pump pressure characteristic:	+	1000H.: (24,536,5)
	+	4th speed 1/min: 2250
1st speed 1/min: 500	+	Charge press. hPa: 750
Charge press. hPa: 750	+	KSB solenoid-operated
Supply-pump	+	valve volt: 12,0
pressure bar: 5,26,4	1	Del quantity cm3/: 36.5 38.5
2nd speed 1/min: 700	$\perp$	Del.quantity cm3/: 36,538,5 1000H.: (35,339,7)
Charge press. hPa: 750	1	5th speed 1/min: 1500
Cumply-nump	T	
Supply-pump	T	Charge press. hPa: 750
pressure bar: 4,14,7	+	KSB solenoid-operated
KSB solenoid-operated	+	valve volt: 12,0
_valve volt: 12,0	+	Del.quantity cm3/: 42,743,7 1000H.: (41,045,4)
3rd speed 1/min: 1500	+	1000H.: (41,045,4)
Charge press. hPa: 750	1	6th speed 1/min: 850
Supply-pump	1	Charge press. hPa: 750
pressure bar: 6,06,6	T	KSB solenoid-operated
KSB solenoid-operated	1	valve volt: 12,0
valve vol+, 12 ft	T	No.1 graphing and 12 77 5 77 5
valve volt: 12,0 4th speed 1/min: 2250	T	Del.quantity_cm3/: 33,534,5
Change the 750	†	1000H.: (31,037,0)
Charge press. hPa: 750	†	7th speed 1/min: 700
Supply-pump	+	KSB solenoid-operated
pressure bar: 7,78,3	+	valve volt: 12,0
KSB solenoid-operated	+	Del.quantity cm3/: 27,028,0
valve volt: 12,0	1	1000H.: (24,530,5)
,	1	8th speed 1/min: 700
Overflow quantity at overflow valve:	1	Charge press. hPa: 750
over few quarterly at over few valve.	T	VCD and amond amond and
1st speed 1/min. 200	T	KSB solenoid-operated
1st speed 1/min: 700	†	valve volt: 12,0
KS9 solenoid-operated	+	Del.quantity cm3/: 37,040,0
valve volt: 12,0	+	1000H: (35,541,5)
Oyeflow : 4183	+	9th speed 1/min: 500
quantity cm3/10s: (2698)	+	KSB solenoid-operated
2nd speed 1/min: 2250	1	valve volt: 12,0
Charge press. hPa: 750	$\perp$	Del.quantity cm3/: 24,529,5
alial 20 hi case til de 170	T	100011 (22.0 72.0)
	T	1000H: (22,032,0)

# Zero delivery (stop):

# Electr. shutoff:

Speed 1/min: 415 ELAB volt: -Del.quantity cm3/: 0,0...3,0 max. 1000H.: -

max.

# Idle delivery:

1st speed 1/min: 390 KSB solenoid-operated volt: 12,0 Del.quantity cm3/: 10,0..12,0 1000H.: (5,5...16,5) 2nd speed 1/min: 415 KSB solenoid-operated

valve volt: 12,0 Del.quantity cm3/: 6,0...10,0 1000H.: (2,5...13,5)

#### Residual:

Speed 1/min: 490 Del.quantity : 3,3...,7,8)

KSB-Solenoid-operated Volt: 12,0 valve

# Automatic starting fuel delivery:

1st speed 1/min: 190 KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 35,0...85,0 ind. 1000H: 35,0

1/min: 390 2nd speed KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 15,0...35,0 max. 1000H: 35,0

# Shutoff electromagnet:

Cut-in

min. voltage : 10,0 Rated voltage : 12.0

# Mounting and assembly dimensions:

Designation

K : K1 KF m : 1,6...2,0 : 1,3 MS mm SVS max. mm

#### Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

Correction at adjusting nut (46)

E16

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MB 9,6 n : 07.04.89 Test sheet Edition Replaces Test oil : ISO-4113 Combination no. : 0 401 846 406 Injection pump Pump designation : PE6P100A320LS805 EP type number : 0 411 806 148 Governor Governor design. : RQ300/1150PA436R : D 421 801 D89 Governer no. Customer-spec. information Customer : DAIMLER-BENZ Engine : OM 401 1st version kW : 136.0 Rated speed : 2300 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Overflow quantity min. 1/h: 100...120 Test nozzle holder : 0 681 343 009 assembly Opening pressure, bar : 172...175 Test lines : 1 680 750 015 Outside diameter x Wall thickness : 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. Values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY

Prestroke mm : 3.40...3.50 : (3.35...3.55) Rack travel in mm : 9.00...12.00 Firing order : 6-3-5-2-4-1 Phasina : 0-45-120-165-240-285 Tolerance  $+ - \circ : 0.50 (0.75)$ Time to cyl. no. : 6 BASIC SETTING 1st speed rpm: 1130 Rack travel in mm : 10.50...10.60 Del.quantity cm3/: 10.1...10.3 100 s: (9.9...10.5) Spread cm3 : 0.3100 s: (0.6) 2nd speed rpm : 350.0 Rack travel in mm : 7.8...8.0 Del.quantity cm3/: 2.5...3.0 100 s: (2.2...3.2) cm3 : 0.3Spread 100 s: (0.5) GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 650 Speed Rack travel in mm : 13.80...14.60 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1130 Del.quantity : [01.0...]05.0) : 3.00 Spread cm3 1000 : (6.00) RATED SPEED 1st version Setting point: Speed : 650 rpm Rack travel in mm: 14.2 Testing: 1st rack travel in: 9.50 rpm : 1180...1190 Speed

2nd rack travel in: 4.10 Speed rpm : 1250...1280 4th rack travel in: 1400 Speed rpm : 0.00...1.00 LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 7.9 Testing: Speed rpm : 100 Minimum rack trave: 9.40 Speed rpm : 300 Rack travel in mm : 7.80...8.00 Rack travel in mm : 2.00 Speed rpm : 360...400 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1150 Rack travel in m: 10.50...10.60 2nd speed rpm : 650 Rack travel in m: 10.50...10.70 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.50 rpm : 1180...1190 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 110.0...130.0 1000 s: (106.0...134.0) Remarks: APPLICATION Omnibus

Note remarks

: MB 11,8 k 1 : 07.04.89 Test sheet Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 401 846 443

Injection pump

Pump designation : PE6P110A720RS371-1

EP type number : D 411 816 166

Governor

Governor design. : RQV300...1100PA551

: 0 421 813 272 Governer no.

Customer-spec. information

Customer : DAIMLER-BENZ

Engine : 0M355A

1st version kW : 206.0 : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 0 681 343 009

Opening |

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 11.70...11.80

Del.quantity cm3/: 16.0...16.2

100 s: (15.7...16.4)

Spread cm3 : 0.4

100 s: (0.8)

rpm : 300.0 2nd speed

Rack travel in mm: 6.1...6.3 Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.2)

Spread cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

: 1.30...1.40 travel mm

rpm : 440 2nd speed

: 2.50...2.90 travel mm

: 1150 3rd speed rpm

: 8.40...8.60 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1100 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100 Aneroid pressure h: 700

Del.quantity : 100.0...164.5)

Spread : 4.00 cm3

1000 : (8.00)

RATED SPEED

1st version Control Lever

position degrees: 64...68

Testina:

1st rack travel in: 10.70

Speed rpm: 1140...1150 2nd rack travel in: 4.00

Speed rpm : 1215...1245 4th rack travel in: 1350

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 8...16

Testing:

Speed rpm : 100 Minimum rack trave: 8.00 Speed rpm: 300
Rack travel in mm: 6.20...6.40
Rack travel in mm: 2.00

Speed rpm : 440...500

CONSTANT REGULATION

rpm : 275...330 Speed

Aneroid/Altitude Compensator Test

1st version Setting

rpm : 500 hPa : 700 Speed Pressure

Rack travel mm : 11.70...11.80

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 11.00...11.10

2nd pressure hPa : 390 Rack travel in m: 11.50...11.60

3rd pressure hPa : 350

Rack travel in m: 11.20...11.30

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700 Speed rpm : 600

E20

Del.quantity cm3/: 156.0...160.0 1000 s: (153.0...163.0)

Spread cm3 : 6.001000 s: (9.00)

Aneroid pressure h: -

Speed rpm: 500 Del.quantity cm3/: 135.0...137.0 1000 s: (132.0...140.0)

cm3 : 6.00 1000 s: (9.00) Spread

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.70

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 135.0...155.0

1000 s: (131.0...159.0)

Remarks:

Note remarks

Test sheet : MB 11,8 i 1 Edition : 07.04.89

Replaces

Test oil : ISO-4113

Combination no. : 0 401 846 450

Injection pump

Pump designation : PE6P110A720RS371-1

EP type number : D 411 816 166

Governor

Governor design. : RQV300...1100PA568

Governer no. : 0 421 813 286

Customer-spec. information

Customer : DAIMLER-BENZ

Engine : 0M355A

1st version kW : 206.0 : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 0 681 343 009 assembly

**Openina** 

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 11.70...11.80

Del.quantity cm3/: 16.0...16.2

100 s: (15.7...16.5)

Spread cm3 : 0.4

100 s: (0.8)

2nd speed rpm : 300.0 Rack travel in mm : 6.1...6.3 Del.quantity cm3/ : 1.3...1.9 100 s: (1.0...2.1)

Spread cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250 travel mm : 1.00...2.00

2nd speed rpm : 540

travel mm : 4.40...4.60

3rd speed rpm : 820

travel mm : 5.90...6.20

rpm : 1100 4th speed

travel mm : 8.30...8.50

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1100 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100 Aneroid pressure h: 700

Del.quantity : 100.0...165.0)

Spread cm3 : 4.00 1000 : (8.00) RATED SPEED 1st version Control Lever position degrees: 64...68 Testing: 1st rack travel in: 10.70 Speed rpm : 1140...1150 2nd rack travel in: 4.00 Speed rpm : 1215...1245 4th rack travel in: 1350 rpm : 0.00...1.50 Speed LOW IDLE 1 Control Lever position degrees: 12...20 Testing: Speed : 100 rpm Minimum rack trave: 8.00 rpm : 300 Rack travel in mm : 6.20...6.40 CONSTANT REGULATION Speed rpm : 275...330 Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 500 hPa : 700 Pressure Rack travel mm : 11.70...11.80 Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 11.00...11.10 2nd pressure hPa : 390 Rack travel in m: 11.50...11.60 3rd pressure hPa : 350 Rack travel in m: 11.20...11.30 START CUT-OUT Speed 1/min: 220 (240)

FUEL DELIVERY CHARACTERISTICS

rpm : 600

Aneroid pressure h: 700

Del.quantity cm3/: 155.0...159.0 1000 s: (152.0...162.0) Spread cm3 : 6.001000 s: (9.00) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 134.0...136.0 1000 s: (131.0...139.0) Spread cm3 : 6.001000 s: (9.00) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.70 rpm : 1140...1150 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 135.0...155.0 1000 s: (131.0...159.0) Remarks:

E22

Speed

1st version

# BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

Test sheet : ENA 11,9 h : 29.03.89 : 2.12.88 Edition Replaces Test oil : ISO-4113

Combination no. : 0 401 846 482

Injection pump

Pump designation : PE6P120A320RS257 EP type number : 0 411 826 075

Governor

Governor design. : RQV250...1100PA680

: 0 421 813 374 Governer no.

Customer-spec, information Customer : ENASA

Engine : 96 T1 AX.BX

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0.8

Test Lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. Values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasina : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1080

Rack travel in mm : 10.00...10.10

Del.quantity cm3/: 18.8...19.0

100 s: (18.5...19.3)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 250.0 2nd speed Rack travel in mm: 5.5...5.7

Del.quantity cm3/: 1.7...2.3 100 s: (1.4...2.6)

Spread cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed : 1.00...1.40 travel mm

2nd speed 350 rpm :

: 1.70...2.30 travel mm

rpm : 650 3rd speed

travel mm : 4.00...4.60 rpm : 1145 4th speed

: 8.30...8.50 travel mm

5th speed rpm : 1225

travel mm : 9.20...9.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1130

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1080 Aneroid pressure h: 900

Del.quantity : 188.0...190.0

1000 : (185.0...193.0)

**E23** 

Spread : 5.00 മ്പ് 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 43...51

Testing:

1st rack travel in: 9.00

Speed rpm : 1140...1150 2nd rack travel in: 4.00

Speed rpm : 1190...1220 4th rack travel in: 1320

Speed rpm : 0.00...1.00

LOW IDLE 1 Control Lever

position degrees: 16...22

Testing:

Speed rpm: 100 Minimum rack trave: 7.10 Speed rpm : 250 Rack travel in mm : 5.50...5.70

CONSTANT REGULATION

rpm : 250...380 Speed

TORQUE CONTROL

Dimension a mm : 0.50

Torque control curve - 1st version

1st speed rpm : 1080 Rack travel in m: 10.00...10.10

2nd speed rpm : 650 Rack travel in m: 10.50...10.70

3rd speed rpm : 850

Rack travel in m: 10.20...10.40

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 man Pressure hPa : 900

: 10.20...10.40 Rack travel mm

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 8.70...9.10

2nd pressure hPa : 415

Rack travel in m: 10.00...10.10

3rd pressure hPa : 290

Rack travel in m: 9.20...9.40

START CUT-OUT

Speed 1/min: 170 (150)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 650 Del.quantity cm3/: 173.0...179.0 1000 s: (170.0...182.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 128.0...130.0

1000 s: (125.0...133.0)

**BREAKAWAY** 

1st version

imm rack travel less than

full load rack tr: 9.00

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 130.0...150.0 1000 s: (126.0...154.0)

Rack travel in mm : 19.50...21.00

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

**APPLICATION** 

Special-purpose vehicle

Note remarks

: MB 11,6 a Test sheet Edition : 07.04.89 : 8.6.88 Replaces Test oil : ISO-4113

Combination no. : 0 401 846 494

Injection pump

Pump designation : PE6P100A720RS473 EP type number : 0 411 806 196

Governor

Governor design. : RQ300/1100PA269-1 Governer no. : 0 421 801 237

Customer-spec, information

Customer : DAIMLER-BENZ

Engine : OM 355

1st version kW : 177.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 0 681 343 009 assembly

Openina .

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60

: (3.45...3.65)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

Phasina : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 12.50...12.60

Del.quantity cm3/: 12.0...12.2

100 s: (11.8...12.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0 Rack travel in mm : 8.1...8.3 Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.5)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 300 : 2.30...2.60 1st speed travel mm

2nd speed rpm : 600

: 6.90...7.10 travel mm

3rd speed rpm : 1150

: 7.30...7.70 travel mm

rpm : 1200 4th speed

travel mm : 10.00...10.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 600 Speed

Rack travel in mm : 13.40...13.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

Del.quantity : 720.0...124.0)

: 3.50 Spread cm3 1000 : (6.00) RATED SPEED 1st version Control lever position degrees: 43...51 Testing: 1st rack travel in: 11.50 Speed rpm: 1140...1150 2nd rack travel in: 4.00 rpm : 1185...1215 Speed 4th rack travel in: 1350 rpm : 0.00...1.50Speed LOW IDLE 1 Control Lever position degrees: 13...21 Testing: Speed rpm : 200 Minimum rack trave: 7.50 Speed : 300 LOW Rack travel in mm : 6.00...6.30 Rack travel in mm : 2.00 : 350...390 Speed rom FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 600 Del.quantity cm3/: 110.0...114.0 1000 s: (107.5...116.5) Spread cm3 : 5.001000 s: (7.) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.50 Speed rpm : 1140...1150 STARTING FUEL DELIVERY Speed rom : 100 Del.quantity cm3/: 150.0...170.0 1000 s: (146.0...174.0) Remarks:

Note remarks

: MB 11,6 a 2 : 07.04.89 Test sheet Edition

: 11.85 Replaces Test oil : ISO-4113

Combination no. : 0 401 846 514

Injection pump

Pump designation : PE6P100A720RS473 EP type number : 0 411 806 196

Governor

Governor design. : RQ300/1100PA269-2

: 0 421 801 293 Governer no.

Customer-spec. information

Customer : DAIMLER-BENZ

Engine : OM 355

: 155.0 1st version kW Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

: 172...175 pressure, bar

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 3.50...3.60

: (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance + - 0

: 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1100 1st speed

Rack travel in mm : 11.80...11.90

Del.quantity cm3/: 10.4...10.6

100 s: (10.2...10.8)

Spread

2nd speed

cm3 : 0.3

100 s: (0.6)

rpm : 300.0

Rack travel in mm: 8.4...8.6 Del.quantity cm3/: 1.7...2.3

100 s: (1.4...2.5)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 600

Rack travel in mm : 13.40...13.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

Del.quantity

104.0...106.0 1000 : (102.0...108.0)

Spread cm3

: 3.50 1000

RATED SPEED

1st version

Setting point:

Speed rpm Rack travel in mm: 13.6

Testing: 1st rack travel in: 10.80

Speed rpm : 1140...1150

**E27** 

2nd rack travel in: 4.00 rpm : 1195...1215 Speed 4th rack travel in: 1350 Speed rpm : 0.00...1.50 LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 8.5 Testina: Speed rpm : 100 Minimum rack trave: 10.10 Speed rpm : 300 Rack travel in mm : 8.40...8.60 Rack travel in mm : 2.00 Speed rpm : 440...480 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 600
Del.quantity cm3/: 89.0...93.0
1000 s: (86.5...95.5) cm3 : 5.00 1000 s: (7.00) Spread **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.80 rpm : 1140...1150 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 150.0...170.0 1000 s: (146.0...174.0) Remarks:

Note remarks

: ENA 12,0 a : 29.03.89 : 22.1.88 Test sheet Edition Replaces

Test oil : ISO-4113

Combination no. : 0 401 846 548

Injection pump

Pump designation : PE6P120A320RS257 EP type number : 0 411 826 075

Governor

Governor design. ; RQ250/1100PA877 : 0 421 501 409 Governer no.

Customer-spec. information Customer : ENASA

: 9156.1301 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening |

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

Test Lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance 4 - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm : 10801st speed

Rack travel in mm : 10.60...10.70

Del.guantity cm3/: 20.0...20.2

100 s: (19.7...20.5)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 250.0 Rack travel in mm : 5.5...5.7 Del.quantity cm3/ : 1.7...2.3 100 s: (1.4...2.6)

Spread cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 550

Rack travel in mm : 15.40...16.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1080Speed Aneroid pressure h: 900

Del.quantity : 200.0...205.0)

: 5.00 Spread cm3

: (9.00) 1000

RATED SPEED

1st version

Setting point:

Speed : 550 rom Rack travel in mm: 16.0

Testing:

1st rack travel in: 9.60

Speed rpm : 1145...1160 2nd rack travel in: 4.00

rpm : 1190...1220 Speed

F01

4th rack travel in: 1300

npm : 0.00...1.00Speed

LOW IDLE 1

Setting point w/out bumper spring

rpm : 250 Rack travel in mm: 5.6

Testing:

rpm : 100 Speed

Minimum rack trave: 7.10
Speed rpm: 250
Rack travel in mm: 5.50...5.70
Rack travel in mm: 2.00
Speed rpm: 340...380

TORQUE CONTROL

Dimension a mm : 0.20

Torque control curve - 1st version

1st speed rpm : 1080

Rack travel in m: 10.60...10.70

2nd speed rpm : 600 Rack travel in m: 11.10...11.30

3rd speed rpm : 720

Rack travel in m: 10.70...10.90

Aneroid/Altitude Compensator Test

1st version

Setting Speed

nom : 500 hPa : 900 Pressure

Rack travel mm : 11.10...11.30

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 8.70...9.10

2nd pressure hPa : 340 Rack travel in m: 9.30...9.40 3rd pressure hPa : 470

Rack travel in m: 10.10...10.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed : 600 rom

Del.quantity cm3/: 182.0...188.0 1000 s: (179.0...191.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 130.0...132.0

1000 s: (127.0...135.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 9.60

Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 130.0...150.0 1000 s: (126.0...154.0)

Rack travel in mm : 19.50...21.00

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

APPLICATION

Special-purpose vehicle

Note remarks

Test sheet : ENA 10,1 d Edition : 07.02.89 : 9.1.89 Replaces Test oil : ISO-4113

Combination no. : D 401 846 549

Injection pump

Pump designation : PE6P100A820LS503 EP type number : 0 411 806 197

Governor

Governor design. : RQV250...1000PA811

: 0 421 813 556 Governer no.

Customer-spec, information Customer : ENASA

Engine : 95 T1 AX.BX

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm

: (2.75...2.95) Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 980

Rack travel in mm: 14.20...14.30

Del.quantity cm3/: 16.5...16.7

100 s: (16.3...16.9)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0 Rack travel in mm: 7.7...7.9 Del.quantity cm3/: 1.8...2.2

100 s: (1.5...2.4)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed

: 1.00...1.40 travel mm rpm : 400 2nd speed

travel mm : 2.20...2.80

3rd speed rpm : 650 : 4.50...5.10 travel mm

4th speed

rpm : 1050 : 8.50...8.70 travel mm

5th speed rpm : 1140 travel mm : 9.70...10.10

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1040 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 980 Aneroid pressure h: 900

: 165.0...167.0 Del.quantity

1000 : (163.0...169.0) cm3 : 3.50

Spread 1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 46...54

Testina:

1st rack travel in: 13.20 Speed rpm : 1040...1050 2nd rack travel in: 4.00

Speed rpm : 1140...1170 4th rack travel in: 1250

Speed rpm : 0.00...1.00

LOW IDLE 1 Control Lever

position degrees: 10...18

Testina:

Speed rpm : 100 Minimum rack trave: 7.50

Speed rpm : 250 Rack travel in mm : 5.90...6.10

CONSTANT REGULATION

rpm : 250...350 Speed

TORQUE CONTROL

Dimension a mm : 0.50

Torque control curve - 1st version
1st speed rpm : 980
Rack travel in m: 14.20...14.30
2nd speed rpm : 550
Rack travel in m: 15.00...15.30

3rd speed rpm : 750

Rack travel in m: 14.80...15.00

4th speed rpm : 850

Rack travel in m: 14.40...14.60

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rom : 500 hPa : 900 Pressure

Rack travel mm : 14.70...14.90

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 12.90...13.30

2nd pressure hPa : 400 Rack travel in m: 14.10...14.20

3rd pressure hPa : 300 Rack travel in m: 13.40...13.60

START CUT-OUT

Speed 1/min: 170 (190)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 700 Del.quantity cm3/: 170.0...174.0

1000 s: (168.0...176.0)

Aneroid pressure h: -

Speed rpm: 500 Del.quantity cm3/: 130.0...132.0 1000 s: (127.0...135.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 13.20

rpm : 1040...1050 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 180.0...200.0 1000 s: (176.0...204.0)

LOW IDLE

Speed rpm : 250 Rack travel in mm : 5.90...6.10

Remarks:

Check electrically unlatched starting

fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Special-purpose vehicle

APPLICATION

### Note remarks

Test sheet : ENA 10,1 d1 : 07.02.89 Edition : 9.1.89 Replaces Test oil : ISO-4113

Combination no. : 0 401 846 549A

Injection pump

Pump designation : PE6P100A820LS503 : 0 411 806 197 EP type number

Governor

Governor design. : RQV250...1000PA811 Governer no. : 0 421 813 556

Customer-spec, information Customer : ENASA

Engine : 95 T1 BV

1st version kW : 165.0 Rated speed : 2000

### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Openina .

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm : (2.75...2.95) Rack travel in mm : 9.00...12.00

F05

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 980

Rack travel in mm : 14.20...14.30

Del.quantity cm3/: 16.5...16.7

100 s: (16.3...16.9)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0 Rack travel in mm: 7.7...7.9 Del.quantity cm3/: 1.8...2.2 100 s: (1.5...2.4) cm3 : 0.3 Spread

100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250 travel mm : 1.00...1.40 2nd speed rpm : 400

: 2.20...2.80 travel mm 3rd speed rpm : 650 travel mm : 4.50...5.10

rpm : 10504th speed travel mm : 8.50...8.70

5th speed rpm : 1140

: 9.70...10.10 travel mm

GUIDE SLEEVE POSITION Control-lever position

> Degree: -1 rpm : 1040

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 980 Aneroid pressure h: 900

Del.quantity : 100.0...169.0)

Spread cm3 : 3.50 1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 46...54

Testing:

1st rack travel in: 13.20

rpm : 1030...1040 Speed

2nd rack travel in: 4.00

Speed rpm : 1130...1160 4th rack travel in: 1250 Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 10...18

Testing:

: 100 Speed rpm Minimum rack trave: 7.50 rpm : 250

Rack travel in mm : 5.90...6.10

CONSTANT REGULATION

rpm : 250...350 Speed

TORQUE CONTROL

Dimension a mm : 0.50

Torque control curve - 1st version

1st speed rpm : 980

Rack travel in m: 14.20...14.30

2nd speed rpm : 550

Rack travel in m: 15.00...15.30 3rd speed rpm : 750 Rack travel in m: 14.80...15.00

4th speed rpm : 850

Rack travel in m: 14.40...14.60

Aneroid/Altitude Compensator Test

1st version

Settina

pm : 500 hPa : 900 Speed rpm Pressure

Rack travel mm : 14.70...14.90

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 12.90...13.30

2nd pressure hPa : 400

Rack travel in m: 14.10...14.20 3rd pressure hPa : 300

F06

Rack travel in m: 13.40...13.60

START CUT-OUT

Speed 1/min : 170 (190)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 700

Del.quantity cm3/: 170.0...174.0 1000 s: (168.0...176.0)

Speed rpm: 450
Del.quantity cm3/: 90.0...94.0
1000 s: (88.0...96.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 130.0...132.0 1000 s: (127.0...135.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 13.20

Speed rpm : 1030...1040

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 180.0...200.0 1000 s: (176.0...204.0)

LOW IDLE

Speed rpm : 250 Rack travel in mm : 5.90...6.10

Remarks:

Check electrically unlatched starting

fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,

the start position must be reached.

APPLICATION

Special-purpose vehicle

# BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

Test sheet : ENA 10,1 d2 Edition : 07.02.89

Replaces

Test oil : ISO-4113

Combination no. : 0 401 846 549B

Injection pump

Pump designation: PE6P100A820LS503 EP type number : 0 411 806 197

Governor

Governor design. ; RQV250...1000PA811

Governer no. : 0 421 813 556

Customer-spec. information Customer : ENASA

Engine : 95 T1 AW

: 155.0 1st version kW : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening |

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm : (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 980

Rack travel in mm : 13.30...13.40

Del.quantity cm3/: 15.0...15.2

100 s: (14.8...15.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0 Rack travel in mm : 7.7...7.9 Del.quantity cm3/: 1.8...2.2 100 s: (1.5...2.4)

Spread cm3 : 0.3100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

: 1.00...1.40 travel mm

2nd speed rpm : 400 travel mm

: 2.20...2.80

3rd speed rpm : 650 travel mm : 4.50...5.10

rpm : 1050 4th speed

: 8.50...8.70 travel mm

rpm : 1140 5th speed

: 9.70...10.10 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1040 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 980 Aneroid pressure h: 900

Del.quantity : 150.0...154.0)

F07

: 3.50 Spread cm3 1000 : (6.00)

RATED SPEED

1st version Control Lever

position degrees: 46...54

Testing:

1st rack travel in: 12.30

Speed rpm : 1030...1040 2nd rack travel in: 4.00

Speed rpm: 1130...1160 4th rack travel in: 1250

Speed rpm : 0.00...1.00

LOW IDLE 1 Control Lever

position degrees: 10...18

Testing:

Speed rpm : 100 Minimum rack trave: 7.50 Speed rpm : 250 Rack travel in mm : 5.90...6.10

CONSTANT REGULATION

rom : 250...350 Speed

TORQUE CONTROL

Dimension a mm : 0.50

Torque control curve - 1st version

1st speed rpm : 980

Rack travel in m: 13.30...13.40 2nd speed rpm : 550

Rack travel in m: 14.00...14.30

3rd speed rpm : 750

Rack travel in m: 13.80...14.00

4th speed rpm : 850

Rack travel in m: 13.50...13.70

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed **npm** hPa : 900

Rack travel mm : 13.30...13.40

Measurement

1/min : 500 Speed

1st pressure hPa : -

Rack travel in m: 12.70...13.00

2nd pressure hPa : 260

Rack travel in m: 13.10...13.20

START CUT-OUT

1/min: 170 (190) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900 Speed rpm: 700 Del.quantity cm3/: 143.0...147.0 1000 s: (141.0...149.0)

Speed rpm: 450 Del.quantity cm3/: 89.0...93.0 1000 s: (87.0...95.0)

Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm3/ : 127.0...129.0
1000 s: (124.0...132.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.30

Speed rpm : 1030...1040

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 180.0...200.0

1000 s: (176.0...204.0)

LOW IDLE

Speed rpm : 250 Rack travel in mm : 5.90...6.10

Remarks:

Check electrically unlatched starting

fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,

the start position must be reached.

**APPLICATION** 

Special-purpose vehicle

Note remarks

Test sheet : ENA 10,1 e Edition : 07.02.89 Replaces : 24.6.88 Test oil : ISO-4113

Combination no. : 0 401 846 552

Injection pump

Pump designation : PE6P100A820LS503-1

EP type number : 0 411 806 198

Governor

Governor design: RQ250/1000PA352-1

: 0 421 801 412 Governer no.

Customer-spec. information Customer : ENASA

Engine : 95 T1 AZ,CZ

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Openina

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90

: (2.85...2.95) Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2Phasina : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 980

Rack travel in mm : 14.20...14.30

Del.guantity cm3/: 16.5...16.7

100 s: (16.3...16.9)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 250.0 Rack travel in mm : 7.8...8.0 Del.quantity cm3/: 1.8...2.2

100 s: (1.5...2.4)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position Degree: -1

rpm : 600 Speed

Rack travel in mm : 16.00...17.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 980 Aneroid pressure h: 900

: 165.0...167.0 Del.quantity 1000 : (163.0...169.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version

Setting point:

rpm Rack travel in mm: 16.5

Testing:

1st rack travel in: 13.20 Speed rpm : 1045...1060 2nd rack travel in: 4.00

rpm : 1100...1130 Speed

4th rack travel in: 1200

rpm : 0.00...1.00Speed

LOW IDLE 1

Setting point w/out bumper spring

rpm : 250 Rack travel in mm : 6.0

Testing:

Speed rpm : 100 Minimum rack trave: 7.50
Speed rpm: 250
Rack travel in mm: 5.90...6.10
Rack travel in mm: 2.00
Speed rpm: 350...390

TORQUE CONTROL

Dimension a mm : 0.40

Torque control curve - 1st version

1st speed rpm : 980

Rack travel in m: 14.20...14.30

2nd speed rpm : 700 Rack travel in m: 15.00...15.50

3rd speed rpm : 825 Rack travel in m: 14.40...14.80

Aneroid/Altitude Compensator Test

1st version

Settina

Speed : 500 rpm hPa : 900 Pressure

Rack travel mm : 14.70...14.90

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 12.90...13.30

2nd pressure hPa : 400

Rack travel in m: 14.10...14.20 3rd pressure hPa : 300

Rack travel in m: 13.40...13.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 700
Del.quantity cm3/: 170.0...174.0
1000 s: (168.0...176.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 130.0...132.0 1000 s: (127.0...135.0)

**BREAKAWAY** 

1st version

F10

1mm rack travel less than

full load rack tr: 13.20

rpm : 1045...1060 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 150.0...170.0

1000 s: (146.0...174.0)

LOW IDLE

Speed rpm : 250 Rack travel in mm : 5.90...6.10

Remarks:

Check electrically unlatched starting

fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,

the start position must be reached.

**APPLICATION** 

Special-purpose vehicle

BOSCH INJ. PUMP TEST SPECIFICATIONS : 2.80...2.90 : (2.75...2.95) Prestroke mm Rack travel in mm : 9.00...12.00 Note remarks Firing order : 1-5-3-6-2-4 Test sheet : RVI 9,8 h Edition : 30.09.88 Replaces Test oil : ISO-4113 Phasina : 0-60-120-180-240-300 Combination no. : D 401 846 561 Tolerance + - ° : 0.50 (0.75) Injection pump Time to cyl. no. : 1 Pump designation : PE6P120A320RS519 EP type number : 0 411 826 145 BASIC SETTING Governor Governor design. : RQ275/1050PA899 rpm: 1050 1st speed Governer no. : 0 421 801 460 Rack travel in mm : 11.00...11.10 Customer-spec. information Customer : RVI Del.quantity cm3/: 16.7...16.9 Engine : MIHS 06.20.45 100 s: (16.4...17.2) 1st version kW : 185.0 Spread cm3 : 0.5Rated speed : 2100 100 s: (0.9) TEST BENCH REQUIREMENTS 2nd speed rpm : 275 Test oil Rack travel in mm: 5.9...6.1 Del.quantity cm3/: 1.2...1.8 inlet temp. °C : 38...42 100 s: (0.9...2.1) Overflow valve Spread cm3 : 0.8 : 1 417 413 025 100 s: (1.2) Inlet press., bar: 1.50 GUIDE SLEEVE POSITION Control-lever position Test nozzle holder Degree: -2 : 1 688 901 019 assembly rpm : 600 Speed Rack travel in mm : 19.20...20.80 **Opening** pressure, bar : 207...210 FULL LOAD DELIV. AT FULL LOAD STOP Orifice plate 1st version diameter mm : 0,8 Speed rpm : 1050 Aneroid pressure h: 700 Del.quantity : 167.0...169.0 Test lines : 1 680 750 067 1000 : (164.0...172.0) : 5.00 Spread cm3 Outside diameter 1000 : (9.00) x Wall thickness x Length mm : 6.00x1.50x1000 RATED SPEED 1st version (A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

Testina: 1st rack travel in: 10.00

rpm Rack travel in mm: 20.0

Setting point:

rom : 1110...1125 Speed 2nd rack travel in: 4.00 rom : 1195...1225 Speed 4th rack travel in: 1350 rom : 0.00...1.00Speed LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 275 Rack travel in mm : 5.0 Speed ' Testing: Speed rpm : 200 Minimum rack trave: 6.70 : 275 Speed rpm Rack travel in mm : 4.90...6.10 Rack travel in mm: 2.00 Speed rpm : 275...315 Aneroid/Altitude Compensator Test 1st version Settina : 500 Speed rpm hPa : 700 Pressure Rack travel mm : 11.00...11.10 Measurement Speed 1/min: 500 1st pressure hPa : -Rack travel in m: 9.40...9.60 2nd pressure hPa : 260 Rack travel in m: 10.50...10.60 3rd pressure hPa : 220 Rack travel in m: 9.60...9.80 START CUT-OUT 1/min: 195 (215) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 rpm : 750 Speed Del.quantity cm3/: 159.0...165.0 1000 s: (156.0...168.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 104.0...106.0 1000 s: (101.0...109.0)

**BREAKAWAY** 

F12

1st version

1mm rack travel less than

full load rack tr: -1.00 rpm : 1110...1125 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 140.0...160.0 1000 s: (136.0...164.0)

LOW IDLE

Speed rpm : 275

Rack travel in mm : 5.90...6.10 Del.quantity cm3/: 12.0...18.0 1000 s: (9.0...21.0) Spread cm3 : 8.00 1000 s: (12.00)

Remarks:

**APPLICATION** 

**Omnibus** 

### Note remarks

: MB 11,0 c : 07.04.89 Test sheet Edition Replaces : 4.85 : ISO-4113 Test oil

Combination no. : 0 401 846 723

Injection pump

Pump designation: PE6P110A320LS3805 EP type number : 0 411 816 718

Governor

Governor design. : RQ300/1150PA187-2R

: 0 421 801 112 Governer no.

Customer-spec. information

Customer : DAIMLER-BENZ

Engine : 0M421

1st version kW : 158.0 Rated speed : 2300

### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 0 681 343 009

Openina

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

: 4.00...4.10 : (3.95...4.15) Prestroke mm Rack travel in mm : 9.00...12.00

: 6-3-5-2-4-1 Firing order

Phasing : 0-45-120-165-240-285

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 6

### BASIC SETTING

rpm: 1150 1st speed

Rack travel in mm : 12.50...12.60

Del.quantity cm3/: 12.2...12.4

100 s: (11.9...12.6)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 8.3...8.5 Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.2)

Spread cm3 : 0.4 100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 600 Speed

Rack travel in mm : 13.80...14.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 122.0...124.0 1000 : (119.5...126.5)

: 4.00 Spread cm3

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm Rack travel in mm: 14.2

Testing:

1st rack travel in: 11.50

rpm : 1190...1200 Speed

2nd rack travel in: 4.00 rpm : 1240...1270 Speed 4th rack travel in: 1400 Speed rpm : 0.00...1.00 LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 8.4 Testing: Speed rpm : 100 Minimum rack trave: 9.90 Speed rpm : 300 Rack travel in mm : 8.30...8.50 Rack travel in mm : 2.00 : 430...470 Speed rom TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1150 Rack travel in m: 12.50...12.60 2nd speed rpm : 600 Rack travel in m: 12.50...12.70 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 600 Del.quantity cm3/ : 114.0...118.0 1000 s: (111.0...121.0) cm3 : 6.00 1000 s: (9.) Spread **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.50 rpm : 1190...1200 Speed STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 130.0...150.0 1000 s: (126.0...154.0)

1000 5. (120.0

Remarks:

### Note remarks

Test sheet : MB 11,0 c 1 Edition : 4.4.89 : 22.10.86 : ISO-4113 Replaces Test oil

: 0 401 846 749 Combination no.

Injection pump

Pump designation: PE6P110A320LS3805 EP type number : 0 411 816 718

Governor

Governor design. : RQ300/1150PA187-6 Governer no. : 0 421 801 155

Customer-spec. information

Customer : DAIMLER-BENZ

Engine : OM 421

1st version kW : 159.0 Rated speed : 2300 : 159.0 2nd version kW Rated speed : 2300

### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10 (3.95...4.15)
Rack travel in mm: 9.00...12.00
Firing order: 6-3-5-2-4-1

Phasing : 0-45-120-165-240-285

Tolerance + - 0 : 0.50 (0.75)

### BASIC SETTING

1st speed rpm: 1150

Rack travel in mm : 11.70...11.80

Del.quantity cm3/: 13.3...13.5

100 s: (13.0...13.7)

cm3 : 0.4Spread

100 s: (0.8)

2nd speed rpm : 300
Rack travel in mm : 7.80...8.00
Del.quantity cm3/ : 1.2...1.8
100 s: (0.9...2.0)

cm3 : 0.4Spread 100 s: (0.8)

1st speed rpm : 1150

Rack travel in mm : 12.5...12.6 Del.quantity cm3/: 12.8...13.0\*

100 s: (12.5...13.3

Spread cm3 : 0.4100 s: (0.8)

rpm : 300 2nd speed

Rack travel in mm : 8.30...8.50 Del.quantity cm3/: 1.2...1.8 \*

100 s: (-) cm3 : 0.4 Spread 100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 650

Speed Rack travel in mm : 13.20...14.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 133.0...135.0 1000 : (130.5...137.5)

cm3 : 4.00 Spread

1000 : (8.00)

2nd version rpm : 1150 Speed Del.quantity cm3/: 128.0...130.0 1000 s: (125.0...133.0) Spread cm3 : 4.01000 s: (8.0) RATED SPEED 1st version Setting point: Speed : 650 rpm Rack travel in mm: 13.6 Testina: 1st rack travel in: 10.70 rpm : 1195...1210 Speed 2nd rack travel in: 4.00 Speed rpm : 1240...1270 4th rack travel in: 1350 Speed rpm : 0.00...1.002nd version Setting point: : 650 Speed rpm Rack travel in mm: 13.6 Testing: 1st rack travel in: 11.50 Speed rpm : 1195...1210 2nd rack travel in: 4.00

Speed

rpm : 1240...1270 4th rack travel in: 1350 Speed rpm : 0.00...1.00

LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 7.90

Testina: Speed rpm : 100 Minimum rack trave: 9.50 Speed rpm : 300 Rack travel in mm : 7.80...8.00 Rack travel in mm: 2.00 Speed : 410...440 rom

FUEL DELIVERY CHARACTERISTICS

1st version Speed rpm : 600 Del.quantity cm3/: 112.0...116.0 1000 s: (109.0...119.0) Spread : 6.00 cm3 1000 s: (9.00)

2nd version : 600 Speed rpm Del.quantity cm3/: 120.0...124.0 1000 s: (117.0...127.0) cm3 : 6.00 1000 s: (9.00) Spread

RACK STOP ADJUSTMENT

Speed : 600 nom

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.70 rpm : 1195...1210 Speed

2nd version 1mm rack travel less than full load rack tr: 11.50 Speed rpm : 1195...1210

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 130.0...150.0 1000 s: (126.0...154.0)

Remarks:

Version 1: Without return-flow restriction Version 2: With return-flow restriction

\* Version 2

#### Note remarks

Test sheet : MB 11,0 c 3 : 07.04.89 Edition : 4.85 Replaces Test oil : ISO-4113

Combination no. : 0 401 846 755

Injection pump

Pump designation : PE6P110A320L\$3805 : 0 411 816 718 EP type number

Governor

Governor design. : RQ300/1150PA187-8

Governer no. : 0 421 801 180

Customer-spec, information

Customer : DAIMLER-BENZ

Engine : 0M421

1st version kW : 148.0 Rated speed : 2300 : 148.0 2nd version kW Rated speed : 2300

### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 0 681 343 009

Opening |

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10 : (3.95...4.15)

Rack travel in mm : 9.00...12.00 Firing order : 6-3-5-2-4-1

: 0-45-120-165-240-285 Phasing

Phasing

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 6

#### BASIC SETTING

rpm: 1150 1st speed

Rack travel in mm : 12.40...12.50

Del.quantity cm3/: 12.9...13.1

100 s: (12.6...13.3)

Spread cm3 : 0.4

100 s: (0.8)

rpm : 300.0 2nd speed

Rack travel in mm: 8.7...8.9 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.4) cm3 : 0.4

Spread 100 s: (0.7)

rpm : 1150 1st speed

Rack travel in mm : 12.6...12.7 Del.quantity cm3/ : 12.7...12.9\* 100 s: (12.4...13.2

Spread cm3 : 0.4

100 s: (0.8)

rpm : 300 2nd speed

Rack travel in mm : 8.50...8.70 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.4)

Spread

cm3 : 0.4 100 s: (0.7)

### GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 650

Rack travel in mm : 13.20...14.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Speed rpm : 1150

Del.quantity : 129.0...133.5) Del.quantity cm3/: 105.0...109.0 1000 s: (102.0...112.0) cm3 : 6.00 Spread 1000 : (8.00) 1000 s: (9.00) 2nd version rpm : 1150 Speed 2nd version Speed rpm : 600
Del.quantity cm3/: 117.0...121.0
1000 s: (114.0...124.0)
Spread cm3 : 6.00 Del.quantity cm3/: 127.0...129.0 1000 s: (124.0...132.0) Spread cm3 : 4.001000 s: (8.00) 1000 s: (9.00) RATED SPEED 1st version RACK STOP ADJUSTMENT Setting point: rpm : 600 Speed Speed : 650 rpm Rack travel in mm: 13.6 **BREAKAWAY** Testing: 1st version 1st rack travel in: 11.40 1mm rack travel less than rpm : 1190...1200 Speed 2nd rack travel in: 4.00 full load rack tr: 11.40 Speed rpm : 1235...1265 4th rack travel in: 1350 Speed rpm : 1190...1200 Speed rpm : 0.00...1.502nd version 1mm rack travel less than 2nd version full load rack tr: 11.60 Speed rpm : 1195...1210 Setting point: : 650 Speed rpm STARTING FUEL DELIVERY Rack travel in mm: 13.6 Testing: rpm : 100 Speed Del.quantity cm3/: 130.0...150.0 1000 s: (126.0...154.0) 1st rack travel in: 11.60 rpm : 1195...1210 2nd rack travel in: 4.00 rpm : 1240...1270 Speed Remarks: 4th rack travel in: 1350 See VDT-I-401/102. rpm : 0.00...1.50 Speed Version 1: Without return-flow LOW IDLE 1 restriction Setting point w/out bumper spring Version 2: With return-flow restriction Speed rpm : 300 Rack travel in mm : 7.1 \* Version 2 Testing: : 100 Speed rom Minimum rack trave: 8.50 rpm : 300 Rack travel in mm : 7.00...7.20 Rack travel in mm : 2.00 Speed rpm : 400...440 FUEL DELIVERY CHARACTERISTICS 1st version : 600 Speed rom

### Note remarks

Test sheet : VOL 10,0 q Edition : 31.03.89 Replaces : 12.6.87 Test oil : ISO-4113

Combination no. : 0 401 846 759

Injection pump

Pump designation : PE6P110A320RS3108Y EP type number : 0 411 816 729

Governor

Governor design. : RQV250...1100PA649 Governer no. : 0 421 815 346

Customer-spec. information Customer : VOLVO

Engine : THD100EC

: 180.0 1st version kW Rated speed : 2200

### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10 : (2.95...3.15)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

#### BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 11.10...11.20

Del.quantity cm3/: 13.8...14.0

100 s: (13.5...14.3)

cm3 : 0.4Spread

100 s: (0.7)

rpm : 250.0 2nd speed Rack travel in mm: 5.2...5.4 Del.quantity cm3/: 3.0...3.4

100 s: (2.7...3.6) Spread cm3 : 0.3

100 s: (0.6)

### (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 250

: 1.10...1.30 travel mm

2nd speed rpm : 500

travel mm : 4.10...4.90

rpm : 700 3rd speed

: 6.30...6.70 travel mm

: 950 4th speed rom

: 6.30...6.70 rpm : 1100 travel mm

5th speed

travel mm : 7.00...7.50

### GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1175

Rack travel in mm : 15.20...17.80

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700 Aneroid pressure h: 900

Del.quantity : 130.0...143.0)

F19

Spread

cm3 : 4.00

1000 : (7.50)

### RATED SPEED

1st version Control lever

position degrees: 61...69

Testing:

1st rack travel in: 10.10

rpm : 1160...1170 Speed

2nd rack travel in: 4.00

Speed rpm: 1225...1255 4th rack travel in: 1350 Speed

Speed rom : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 8...16

Testing:

Speed : 100 rom Minimum rack trave: 6.70

Speed rpm : 250 Rack travel in mm : 5.20...5.40

CONSTANT REGULATION

rpm : 250...425 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500 hPa : 900 Pressure

: 11.10...11.20 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.60...9.80 2nd pressure hPa : 275

Rack travel in m: 9.90...10.00

3rd pressure hPa : 400

Rack travel in m: 10.70...10.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 700 Del.quantity cm3/ : 105.5...108.5

1000 s: (103.0...111.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.10

rpm : 1160...1170 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 170.0...200.0

1000 s: (166.0...204.0) Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.20...5.40
Del.quantity cm3/ : 30.0...34.0
1000 s: (27.5...36.5)

cm3 : 3.00Spread

1000 s: (6.00)

Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm.

Permissible alteration from 2.20...2.90

Check electrically unlatched starting

fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,

the start position must be reached.

**APPLICATION** 

**Omnibus** 

#### Note remarks

Test sheet : VOL 10,0 q1 Edition : 07.03.88 Replaces : 12.6.87 Test oil : ISO-4113

Combination no. : 0 401 846 760

Injection pump

Pump designation : PE6P110A320RS3108X EP type number : 0 411 816 730

Governor

Governor design. : RQV250...1100PA649 Governer no. : 0 421 813 346

Customer-spec. information Customer : VOLVO

Engine : THD100ED

1st version kW : 203.0 : 2200 Rated speed

### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

**Openina** 

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10 : (2.95...3.15)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.10...12.20

Del.quantity cm3/: 16.0...16.2

100 s: (15.7...16.5)

cm3 : 0.4Spread

100 s: (0.7)

2nd speed rpm : 250.0 Rack travel in mm : 5.0...5.2 Del.quantity cm3/ : 3.0...3.4 100 s: (2.7...3.6)

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250 travel mm

: 1.10...1.30 rpm : 500 2nd speed

travel mm : 4.10...4.90

rpm : 700 3rd speed

travel mm : 6.30...6.70 4th speed rpm : 950

: 6.30...6.70 travel mm

5th speed rpm : 1100

travel mm : 7.00...7.50

GUIDE SLEEVE POSITION Control-lever position

> Degree: -1 rpm : 1175

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rom : 700 Aneroid pressure h: 900

Del.quantity : 100.0...165.0)

Spread

cm3 : 4.00 1000 : (7.50)

RATED SPEED

1st version

Control Lever

position degrees: 61...69

Testing:

1st rack travel in: 11.10

Speed rpm : 1160...1170

2nd rack travel in: 4.00

rpm : 1225...1255 Speed

4th rack travel in: 1350

Speed rpm : 0.00...1.00

LOW TOLF 1

Control lever

position degrees: 8...16

Testina:

Speed : 100 rom

Minimum rack trave: 6.70 rpm : 250 Speed

Rack travel in mm : 5.00...5.20

CONSTANT REGULATION

rpm : 250...425 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpm hPa : 900 Pressure

Rack travel mm : 12.10...12.20

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.30...9.40

2nd pressure hPa : 275

Rack travel in m: 9.60...9.70

3rd pressure hPa : 650

Rack travel in m: 11.70...11.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

rpm : 700 Speed

Del.quantity cm3/: 105.5...108.5

1000 s: (103.0...111.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.10

Speed rpm : 1160...1170

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 170.0...200.0

1000 s: (166.0...204.D)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250 Rack travel in mm : 5.00...5.20 Del.quantity cm3/: 30.0...34.0

1000 s: (27.5...36.5)

cm3 : 3.00 Spread

1000 s: (6.00)

Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm.

Permissible alteration from 2.20...2.90

Check electrically unlatched starting

fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

**APPLICATION** 

**Omnibus** 

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MB 11,0 o 1 : 07.04.89 Test sheet Edition : 4.85 Replaces Test oil : ISO-4113 Combination no. : 0 401 846 762 Injection pump Pump designation : PE6P110A320LS3805-10 EP type number : 0 411 816 740 Governor Governor design. : RQ300/1000PA187 Governer no. : 0 421 801 182 Customer-spec. information Customer : DAIMLER-BENZ Engine : 0M421 1st version kW : 140.0 Rated speed : 2000 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 quantity min. 1/h: 100...120 : 0 681 343 009 assembly : 172...175 pressure, bar : 1 680 750 015

Overflow Test nozzle holder **Opening** Test Lines

Outside diameter x Wall thickness x Lenath mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 4.00...4.10 : (3.95...4.15) Prestroke mm Rack travel in mm : 9.00...12.00 Firing order : 6-3-5-2-4-1

Phasing : 0-45-120-165-240-285

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 11.50...11.60

Del.quantity cm3/: 12.0...12.2

100 s: (11.7...12.5)

Spread cm3 : 0.4

100 s: (0.8)

rpm : 300.02nd speed Rack travel in mm: 8.0...8.2 Del.quantity cm3/: 1.5...2.1 100 s: (1.2...2.3) cm3 : 0.4 Spread

100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position Degree: -1

rpm : 650

Rack travel in mm : 13.00...14.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 120.5...122.5 1000 : (117.5...125.5)

Spread : 4.00 cm3 1000 : (8.00)

RATED SPEED

1st version

Setting point:

rpm Rack travel in mm: 13.5

Testing:

1st rack travel in: 10.60

rpm : 1040...1050 Speed

2nd rack travel in: 4.00 Speed rpm : 1075...1105 LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 8.1 Testing: Speed rpm : 100 Minimum fack trave: 9.50 Speed rpm: 300 Rack travel in mm: 8.00...8.20 Rack travel in mm: 2.00 Speed rpm : 430...470 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 600 Del.quantity cm3/ : 102.0...106.0 1000 s: (99.0...109.0) cm3 : 6.00 1000 s: (9.00) Spread **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.60 Speed rpm : 1040...1050 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 130.0...150.0 1000 s: (126.0...154.0) Remarks:

Note remarks

Test sheet : SCA 8,0 m 3 Edition : 09.03.87 : 4.85 Replaces

Test oil : ISO-4113

Combination no. : 0 401 846 775

Injection pump

Pump designation : PE6P110A720RS3076 EP type number : G 411 816 720

Governor

Governor design. : RQ750PA528 : 0 421 801 126 Governer no.

Customer-spec. information Customer : SCANIA

: DS8 42 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: D 681 343 009 assembly

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.30...3.40 : (3.25...3.45) Prestroke mm

Rack travel in mm: 9.00...12.00 Firing order: 1-5-3-6-2-

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 11.90...12.00

Del.quantity cm3/: 11.7...11.9

100 s: (11.5...12.1)

Spread cm3 : 0.5

100 s: (0.7)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

: 117.0...119.0 Del.quantity 1000 : (115.0...121.0)

cm3 : 5.00 1000 : (7.00) Spread

RATED SPEED

1st version

Testing:

1st rack travel in: 10.90 Speed rpm : 750...755

2nd rack travel in: 4.00 Speed rpm : 773...783

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.90

rpm : 750...755 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 190.0...240.0

1000 s: (-)

Rack travel in mm : 20.00...21.00

HIGH IDLE

1st version

Rack travel in mm : 4.90...5.10

Remarks:

ADDITIONAL INFORMATION

Check and set without ROBO diaphragam

For comb. with letter index see VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over on Aug. 22, 1983

Engine start of delivery: 18° BTDC

Firing sequence of engine: 1-5-3-6-2-4.

APPLICATION

Generator

BOSCH INJ. PUMP TEST SPECIFICATIONS : 4.00...4.10 : (3.95...4.15) Prestroke mm Rack travel in mm : 9.00...12.00 Note remarks Firing order : 6-3-5-2-4-1 Test sheet : MB 11,0 r : 07.04.89 Edition Replaces : 31.7.87 Test oil : ISO-4113 Phasina : 0-45-120-165-240-285 : 0 401 846 805 Combination no. Tolerance + - ° : 0.50 (0.75) Injection pump Time to cyl. no. : 6 Pump designation: PE6P110A320LS3814-10 : 0 411 816 741 EP type number BASIC SETTING Governor Governor design. : RQ300/1150PA187-6 1st speed rpm: 1150 : 0 421 801 155 Governer no. Rack travel in mm : 12.40...12.50 Customer-spec. information Customer : DAIMLER-BENZ Del.quantity cm3/: 13.2...13.4 Engine : 0M421 100 s: (12.9...13.6) 1st version kW : 159.0 Spread cm3 : 0.4Rated speed : 2300 100 s: (0.8) TEST BENCH REQUIREMENTS rpm : 300.02nd speed Test oil Rack travel in mm: 8.3...8.5 inlet temp. °C : 38...42 Del.quantity cm3/: 1.2...1.8 100 s: (0.9...2.0) Overflow valve cm3 : 0.4 Spread 100 s: (0.7) : 1 417 413 025 Inlet press., bar: 1.50 GUIDE SLEEVE POSITION Control-lever position Overflow Degree: -1 quantity min. 1/h: 100...120 rpm : 650 Speed Rack travel in mm : 13.20...14.00 Test nozzle holder : 0 681 343 009 assembly FULL LOAD DELIV. AT FULL LOAD STOP Opening. 1st version pressure, bar : 172...175 Speed rpm : 1150 Del.quantity : 132.0...134.0 1000 : (129.5...136.5) Test lines : 1 680 750 015 : 4.00 Spread cm31000 : (8.00) Outside diameter x Wall thickness RATED SPEED x Length mm : 6.00x1.50x600 1st version (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. Setting point: : 650 Speed rpm : 650 Rack travel in mm : 13.6 per values

Testing:

Speed

1st rack travel in: 11.50

rpm : 1190...1200

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

2nd rack travel in: 4.00 rpm : 1235...1265 Speed 4th rack travel in: 1350 Speed rpm : 0.00...1.50LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 8.4 Testing: Speed rpm : 100 Minimum rack trave: 10.00 : 300 Speed rpm Rack travel in mm : 8.30...8.50 Rack travel in mm : 2.00 rpm : 430...470 Speed FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 600 Del.quantity cm3/: 110.0...114.0 1000 s: (107.0...117.0) Spread cm3 : 6.001000 s: (9.00) RACK STOP ADJUSTMENT Speed rpm : 600 BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.50 Speed rpm : 1190...1200 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 130.0...150.0 1000 s: (126.0...154.0) Remarks:

: KABBOHRER

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : VOL 12,1 a Edition : 07.04.89 Replaces : 12.9.86 Test oil : ISO-4113 Combination no. : 0 401 846 813 Injection pump Pump designation : PE6P120A320RS3165 EP type number : 0 411 826 747 Governor Governor design. : RQV300...1050PA657-2 : 0 421 813 419 Governer no. Customer-spec. information Customer : VOLVO/B : TD121K Engine 1st version kW : 228.0 : 2100 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Opening | pressure, bar : 207...210 Orifice plate diameter mm : 0,8 : 1 680 750 067

Test lines Outside diameter x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 2.60...2.70 : (2.55...2.75) Prestroke mm Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 12.30...12.40

Del.quantity cm3/: 21.7...21.9

100 s: (21.4...22.2)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 300.0 2nd speed Rack travel in mm : 4.5...4.7 Del.quantity cm3/: 1.7...2.1 100 s: (1.4...2.4) Spread cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL 1st speed rpm : 300 1.60...1.80 travel mm 2nd speed rpm : 450 3.60...4.00 travel mm 3rd speed rpm : 700 : 6.40...6.60 travel mm 4th speed rpm : 950 : 6.40...6.60 travel mm 5th speed rpm : 1110

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1150

: 7.80...8.00

Speed Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

travel mm

Speed rpm : 700 Aneroid pressure h: 1000 Del.quantity : 217.0...217.0 1000 : (214.0...222.0)

: 5.00 1000 : (9.00)

### RATED SPEED

1st version Control lever

position degrees: 58...66

Testing:

1st rack travel in: 11.30 rpm : 1105...1115 Speed

2nd rack travel in: 4.00

Speed rpm : 1170...1200

4th rack travel in: 1300

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 7...15

Testing:

Speed : 100 rom Minimum rack trave: 6.10 : 300 rpm

Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

rpm : 300...420 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 rpm hPa : 1000 Pressure

Rack travel mm : 12.30...12.40

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 8.50...8.70

2nd pressure hPa : 125

Rack travel in m: 8.90...9.00

3rd pressure hPa : 655

Rack travel in m: 11.90...12.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

Speed rpm : 1000 Del.quantity cm3/: 217.0...223.0

1000 s: (215.0...225.0)

Aneroid pressure h: -

Speed rpm: 700
Del.quantity cm3/: 132.0...134.0
1000 s: (129.0...137.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.30

Speed rpm : 1105...1115

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 240.0...270.0 1000 s: (236.0...274.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

rpm : 300 Speed

Rack travel in mm : 4.50...4.70

Del.quantity cm3/: 17.0...21.0 1000 s: (14.5...24.5)

cm3 : 4.00 Spread

1000 s: (7.00)

Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm.

Permissible alteration from 2.20...2.90

### Note remarks

Test sheet : MB 11,0 s Edition : 07.04.89 Replaces : 12.9.86 Test oil : ISO-4113

Combination no. : 0 401 846 823

Injection pump

Pump designation : PE6P110A320LS3835 EP type number : 0 411 816 749

Governor

Governor design. : RQ300/900PA187-14 Governer no. : 0 421 801 357

Customer-spec, information

Customer : DAIMLER-BENZ

Engine : OM441

: 150.0 1st version kW Rated speed : 1800

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.00...4.10 Prestroke mm : (3.95...4.15)

Rack travel in mm : 9.00...12.00 Firing order : 6-3-5-2-4-1

Phasina : 0-45-120-165-240-285

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

### BASIC SETTING

1st speed rpm: 900

Rack travel in mm: 12.50...12.60

Del.quantity cm3/ : 12.6...12.8

100 s: (12.3...13.0)

Spread cm3 : 0.4

100 s: (0.8)

2nd speed rpm : 300.0 Rack travel in mm : 8.0...8.2 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.4) Spread cm3 : 0.4

100 s: (0.7)

### GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm: 650 Rack travel in mm: 13.20...14.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del.quantity : 126.0...128.0

1000 : (123.5...130.5)

Spread cm3 : 4.00

1000 : (8,00)

#### RATED SPEED

#### 1st version

Setting point: Speed rpm

Rack travel in mm: 13.6

Testing:

1st rack travel in: 11.50 rpm : 940...950 Speed

2nd rack travel in: 4.00 Speed rpm: 985...1015 4th rack travel in: 1100 rpm : 0.00...1.50 Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 8.1

Testing:

Speed rpm : 100 Minimum rack trave: 9.30 rpm : 300 Speed

Rack travel in mm: 8.00...8.20
Rack travel in mm: 2.00
Speed rpm: 430...470

FUEL DELIVERY CHARACTERISTICS

1st version

Speed : 600 rpm

Del.quantity cm3/: 124.0...128.0 1000 s: (121.0...131.0)

cm3 : 6.00 Spread 1000 s: (9.00)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.50 Speed rpm : 940...950

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 130.0...150.0

.

1000 s: (126.0...154.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet Edition Replaces Test oil : VOL 12,2 a : 31.03.89 : 7.1.88 : ISO-4113 Combination no. : 0 401 846 827 Injection pump Pump designation : PE6P120A320RS3178 EP type number : 0 411 826 752 Governor Governor design. : RQV250...950PA657-11 Governer no. : 0 421 813 568 Customer-spec. information Customer : VOLVO : TD122F Engine 1st version kW : 257.0 Rated speed : 1900 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder assembly : 1 688 901 019 Opening pressure, bar : 207...210 Orifice plate diameter mm : 0,8

Test lines	: 1 680 750 067
Outside diameter x Wall thickness	

: 6.00X1.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

Rack travel in mm Firing order	: (3.553.75) : 9.0012.00 : 1-5-3-6-2-4
Phasing	: 0-60-120-180-240-300
Tolerance + - °	: 0.50 (0.75)
Time to cyl. no.	: 1
BASIC SETTING	
1st speed rpm	: 700
Rack travel in mm	: 13.0013.10
Del.quantity cm3/	: 22.923.1
100 :	s: (22.623.4)
Spread cm3	: 0.5
100 :	s: (0.9)
2nd speed rpm Rack travel in mm Del.quantity cm3/	: 4.64.8
Spread cm3	: 0.5 s: (0.7)
(B) Setting of injection pump with governor	
GUIDE SLEEVE TRAVE 1st speed rpm travel mm 2nd speed rpm travel mm 3rd speed rpm travel mm 4th speed rpm travel mm 5th speed rpm travel mm	: 250 : 1.001.40
GUIDE SLEEVE POSITION Control-lever position Degree: -1 Speed rpm : 1000 Rack travel in mm : 15.2017.80	
FULL LOAD DELIV. A	T FULL LOAD STOP
1st version Speed rpm : 700 Aneroid pressure h: 900	

Prestroke mm

: 3.60...3.70

x Length mm

Del.quantity : 229.0...234.0)

: 5.00 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 60...68

Testing:

1st rack travel in: 12.00 rpm : 980...990 Speed 2nd rack travel in: 4.00

Speed rpm : 1060...1090 4th rack travel in: 1200

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 5...13

Testina:

rpm : 100 Speed Minimum rack trave: 6.20 rpm : 250

Rack travel in mm : 4.60...4.80

CONSTANT REGULATION

rom : 250...380 Speed

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 500 rpm hPa : 900 Pressure

: 13.00...13.10 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.80...10.00

2nd pressure hPa : 100

Rack travel in m: 10.20...10.30

3rd pressure hPa : 570 Rack travel in m: 12.70...12.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: rpm\_ : 700 Speed

Del.quantity cm3/: 163.0...165.0 1000 s: (160.0...168.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 12.00 rpm : 980...990 Speed

STARTING FUEL DELIVERY

LOW IDLE

rpm : 250 Speed

Rack travel in mm : 4.60...4.80 Del.quantity cm3/: 17.5...22.5 1000 s: (14.5...25.5)

cm3 : 5.00Spread

1000 s: (7.00)

Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm.

Permissible alteration from 2.20...2.90

BOSCH INJ. PUMP TEST SPECIFICATIONS : 3.80...3.90 : (3.75...3.95) Prestroke mm Note remarks Firing order Test sheet : ENA 11.9 c Edition : 17.02.89 : 5.8.88 Replaces Test oil : ISO-4113 Phasing Combination no. : 0 401 846 860 Tolerance + - 0 Injection pump Time to cyl. no. : 1 Pump designation : PE6P12DA32DRS3200 EP type number : 0 411 826 766 BASIC SETTING Governor Governor design. : RQV250...1000PA808-1 1st speed rom: 600 : 0 421 813 660 Governer no. Customer-spec, information Customer : FNASA Engine : 96 R1 BX 1st version kW : 265.0 Spread cm3 : 0.5Rated speed : 2000 TEST BENCH REQUIREMENTS 2nd speed Test oil inlet temp. °C : 38...42 Overflow valve cm3 : 0.8 Spread : 1 417 413 025 Inlet press., bar: 1.50 with governor Test nozzle holder assembly : 1 688 901 019 GUIDE SLEEVE TRAVEL rpm : 250 1st speed **Openina** travel mm : 207...210 pressure, bar 350 2nd speed rom : travel mm Orifice plate rpm : 700 3rd speed diameter mm : 0.8 travel mm rpm : 1055 4th speed travel mm Test lines : 1 680 750 067 : 1145 5th speed rpm travel mm Outside diameter x Wall thickness GUIDE SLEEVE POSITION x Length mm : 6.00X1.50X1000 Control-lever position

Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 : 0-60-120-180-240-300 : 0.50 (0.75) Rack travel in mm : 11.90...12.00 Del.quantity cm3/: 24.9...25.1 100 s: (24.6...25.4) 100 s: (0.9) rpm : 250.0 Rack travel in mm : 3.3...3.7 Del.quantity cm3/ : 1.7...2.3 100 s: (1.4...2.6) 100 s: (1.2) (B) Setting of injection pump : 1.00...1.40 2.10...2.60 4.70...5.30 : 7.90...8.10 : 9.00 ... 9.40 Degree: -1 Speed rpm : 1100 Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 600 Aneroid pressure h: 1200

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Del.quantity : 249.0...251.0 1000 : (246.0...254.0)

cm3 : 5.00 Spread

1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 50...58

Testing:

1st rack travel in: 10.90

rpm : 1050...1060 Speed

2nd rack travel in: 4.00

Speed rpm : 1130...1160

4th rack travel in: 1250

Speed npm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 8...16

Testing:

Speed rpm : 100 Minimum rack trave: 5.00 : 250 Speed COM

Rack travel in mm : 3.30...3.70

CONSTANT REGULATION

rpm : 250...330 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500 hPa : 1200 Pressure

: 11.90...12.00 Rack travel mm

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 8.50...8.90

2nd pressure hPa : 680

Rack travel in m: 11.30...11.40

3rd pressure hPa : 420

Rack travel in m: 9.50...9.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 900
Del.quantity cm3/: 244.0...250.0
1000 s: (241.0...253.0)

608

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 149.0...152.0 1000 s: (146.5...154.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.90

rpm : 1050...1060 Speed

STARTING FUEL DELIVERY

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

APPLICATION

Special-purpose vehicle

### Note remarks

Test sheet : ENA 11.9 e Edition : 17.02.89 Replaces : 11.7.88 Test oil : ISO-4113

Combination no. : 0 401 846 861

Injection pump

Pump designation : PE6P12OA32ORS3176-1 EP type number : 0 411 826 767

Governor

Governor design. : RQV250...1050PA808

Governer no. : 0 421 813 553

Customer spec. information Customer : ENASA

Engine : 96 R1 AX

### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0.8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.80...3.90 : (3.75...3.95) Rack travel in mm : 9.00...12.00

G09

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 1

#### BASIC SETTING

1st speed rpm: 650

Rack travel in mm : 12.40...12.50

Del.quantity cm3/: 21.2...21.4

100 s: (20.9...21.7)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0 Rack travel in mm : 4.2...4.4 Del.quantity cm3/ : 2.5...3.1 100 s: (2.2...3.4)

Spread cm3 : 0.8 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.00...1.40 2nd speed rpm : 350

nd speed rpm : 350 travel mm : 2.10...2.60

3rd speed rpm: 700

travel mm : 4.50...5.10 4th speed rpm : 1095

travel mm : 8.00...8.20

5th speed rpm : 1200

travel mm : 9.20...9.60

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1180

Rack travel in mm: 15.20...17.80

MACK ELEVEL III IIIII . 13.20..........

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 650 Aneroid pressure h: 900

Del.quantity : 212.0...214.0

1000 : (209.0...217.0)

Spread cm3 : 5.00 1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 50...58

Testing:

1st rack travel in: 11.40

Speed rpm : 1090...1100 2nd rack travel in: 4.00

Speed rpm : 1185...1215

4th rack travel in: 1300

Speed rom : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 11...19

Testina:

Speed rpm : 100 Minimum rack trave: 5.90 rpm : 250

Rack travel in mm : 4.20...4.40

CONSTANT REGULATION

rpm : 250...350 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500 Pressure hPa : 900

Rack travel mm : 12.40...12.50

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 9.90...10.30
2nd pressure hPa : 390
Rack travel in m: 11.90...12.00
3rd pressure hPa : 160
Rack travel in m: 10.50...10.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 1030 Del.quantity cm3/ : 215.0...221.0 1000 s: (212.0...224.0)

Aneroid pressure h: -

Speed rpm : 500

G10

Del.quantity cm3/: 151.0...153.0 1000 s: (148.0...156.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.40

Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Remarks:

Delivery-valve spring pre-tension 3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

**APPLICATION** 

Special-purpose vehicle

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : UNI 13,8 c1 : 29.03.89 Test sheet Edition : 16.6.88 Replaces Test oil : ISO-4113 Combination no. : 0 401 846 879 Injection pump Pump designation : PE6P120A720RS3192 EP type number : 0 411 826 761 Governor Governor design. : RQV300...900PA857-1 Governer no. : 0 421 813 683 Customer-spec. information Customer : IVECO-UNIC Engine : 8210.42.101 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Opening . : 207...210 pressure, bar Orifice plate diameter mm : 0,8 Test Lines : 1 680 750 067 Outside diameter x Wall thickness x Lenath mm : 6.00x1.50x1000 (A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

: 3.40...3.50

per values

BEGINNING OF DELIVERY

Prestroke mm

Test pressure, bar: 25...27

: (3.35...3.55) Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance  $+ - \circ : 0.50 (0.75)$ Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 900 Rack travel in mm: 13.10...13.20 Del.quantity cm3/: 23.6...23.8 100 s: (23.3...24.1) Spread cm3 : 0.5100 s: (0.9) 2nd speed rpm : 300.0 Rack travel in mm : 4.9...5.1 Del.quantity cm3/: 1.8...2.4 100 s: (1.5...2.7) Spread cm3 : 0.8100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 3001st speed : 0.70...0.90 travel mm 2nd speed rpm : 550 : 4.00...4.60 travel mm 3rd speed rpm : 800 : 6.60...6.90 travel mm 4th speed rpm : 900 : 7.70...7.90 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 950 Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 900 Aneroid pressure h: 900 Aneroiu Del.quantity 1000 : 236.0...238.0 : (233.0...241.0) : 5.00 Spread cm3 1000 : (9.00)

G11

### RATED SPEED

1st version Control Lever

position degrees: 57...65

Testing:

1st rack travel in: 12.10 rpm : 940...950 Speed 2nd rack travel in: 4.00

Speed rpm : 1060...1090

4th rack travel in: 1200

Speed rpm : 0.00...1.00

LOW IDLE 1 Control Lever

position degrees: 4...12

Testing:

Speed man Minimum rack trave: 6.50 rpm : 300

Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

rpm : 370...490 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

rpm : 500 hPa : 900 Speed rpm Pressure

: 13.20...13.30 Rack travel mm

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 9.10...9.30

2nd pressure hPa : 520 Rack travel in m: 12.20...12.30 3rd pressure hPa : 330 Rack travel in m: 9.80...10.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm: 500 Del.quantity cm3/: 230.0...236.0 1000 s: (227.0...239.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 111.0...113.0

1000 s: (108.0...116.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.10

Speed rpm : 940...950

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 235.0...265.0 1000 s: (231.0...269.0)

LOW IDLE

rpm : 300 Speed

Rack travel in mm : 4.90...5.10 Del.quantity cm3/: 18.0...24.0 1000 s: (15.0...27.0) Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

#### Note remarks

Test sheet : MB 11,0 s 9 Edition : 07.04.89 Replaces : 24.6.88 Test oil : ISO-4113

Combination no. : 0 401 846 880

Injection pump

Pump designation : PE6P110A320LS3835-1 EP type number

Governor

: 0 411 816 755

Governor design. : RQ300/1050PA187-19 Governer no. : 0 421 801 428

Customer-spec. information

Customer : DAIMLER-BENZ

Engine : OM441

1st version kW : 160.0 Rated speed : 2100

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10 : (3.95...4.15)

Rack travel in mm : 9.00...12.00 : 6-3-5-2-4-1 Firing order

Phasina : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 6

#### BASIC SETTING

1st speed rpm: 750

Rack travel in mm : 13.00...13.10

Del.quantity cm3/: 12.6...12.8

100 s: (12.2...13.0)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0 Rack travel in mm : 8.3...8.6 Del.quantity cm3/ : 1.5...2.1

100 s: (1.2...2.3)

cm3 : 0.4Spread

100 s: (0.7)

#### GUIDE SLEEVE POSITION Control-lever position

Degree: -1
Speed rpm: 650
Rack travel in mm: 13.80...14.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Del.quantity : 126.0...128.0 1000 : (122.5...130.5)

Spread cm3 : 4.00

1000 : (7.50)

#### RATED SPEED

1st version

Setting point:

Speed rpm Rack travel in mm: 14.1

Testing:

1st rack travel in: 12.00 Speed rpm : 1090...1100

2nd rack travel in: 4.00 rpm : 1150...1180 Speed 4th rack travel in: 1300 rpm : 0.00...2.00 Speed LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 7.0 Testing: Speed rpm: : 200 Minimum rack trave: 8.70 Speed rpm : 300
Rack travel in mm : 6.80...7.20
Rack travel in mm : 2.00 Speed rpm : 400...440 TORQUE CONTROL Torque control curve - 1st version rpm : 1050 1st speed 2nd speed : 600 rpm 3rd speed : 900 rpm FUEL DELIVERY CHARACTERISTICS 1st version : 1050 Speed rpm Del.quantity cm3/: 138.0...142.0 1000 s: (135.0...145.0) cm3 : 7.00Spread 1000 s: (10.) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.00 Speed rpm : 1090...1100 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 130.0...150.0 1000 s: (126.0...154.0) Remarks: APPLICATION Omnibus

#### Note remarks

Test sheet : SSC 10,5 e Edition : 07.02.89 Replaces : 5.8.88 Test oil : ISO-4113

Combination no. : 0 401 846 884

Injection pump

Pump designation : PE6P130A320LS3210 EP type number : 0 411 836 713

Governor

Governor design. : RQV400...750PA607

: 0 421 813 313 Governer no.

Customer-spec. information Customer : SSCM

Engine : UD 25.L6

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

**Opening** 

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90

: (2.75...2.95) Rack travel in mm : 9.00...12.00

G15

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm: 14.50...14.60

Del.quantity cm3/: 38.8...39.1

100 s: (38.4...39.4)

Spread cm3 : 0.6

100 s: (1.0)

rpm : 400.0 2nd speed Rack travel in mm : 5.4...5.6 Del.quantity cm3/ : 2.7...3.3

100 s: (2.3...3.7) cm3 : 1.0 Spread

100 s: (1.4)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 400

: 0.20...0.50 travel mm

rpm : 500 2nd speed

travel mm : 1.90...2.10

3rd speed rpm : 650

travel mm : 1.90...2.10

: 750 4th speed rom

: 4.50...5.50 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Speed Del.quantity 1900 : 388.0...391.0 : (384.5...394.5)

Spread cm3

: 6.00

1000 : (10.00)

RATED SPEED

1st version

Testing:

1st rack travel in: 13.50

rom : 750...755 Speed

2nd rack travel in: 4.00 Speed rpm : 776...789 4th rack travel in: 950 Speed rpm : 0.00...1.00LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 400 Rack travel in mm : 5.5

Testing:

Speed rpm : 100 Minimum rack trave: 7.00 rpm : 400 Speed Rack travel in mm : 5.40...5.60 Rack travel in mm : 2.00 rpm : 650...750 Speed

## **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 13.50 rpm : 750...755 Speed

#### LOW IDLE

1000 s: (14.00)

Remarks:

## APPLICATION

Generator set

Note remarks

Test sheet : MB 11,0 s11 Edition : 07.02.89 : 9.1.89 Replaces Test oil : ISO-4113

Combination no. : 0 401 846 889

Injection pump

Pump designation : PE6P110A320LS3835-1

EP type number : 0 411 816 755

Governor

Governor design. : RQV300...900PA524-10

: 0 421 813 549 Governer no.

Customer-spec. information

Customer : DAIMLER-BENZ

Engine : OM 441

1st version kW : 150.0 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.00...4.10 Prestroke mm : (3.95...4.15)

Rack travel in mm : 9.00...12.00 : 6-3-5-2-4-1 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

rpm: 900 1st speed

Rack travel in mm : 12.90...13.00

Del.quantity cm3/: 12.6...12.8

100 s: (12.3...13.0)

cm3 : 0.4Spread

100 s: (0.8)

rpm : 300.02nd speed Rack travel in mm: 8.7...8.9 Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.4)

Spread cm3 : 0.4100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 300 : 1.20...1.40 1st speed travel mm

2nd speed rpm : 500 : 3.50...3.80

travel mm rpm : 950 3rd speed

: 8.30...8.70 travel mm

rpm : 1000 4th speed

: 9.40...10.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Dearee: -1

rpm : 950 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 900 Speed

Del.quantity : 126.0...128.0

1000 : (123.5...130.5)

cm3 : 4.00 1000 : (8.00) cm3 Spread RATED SPEED 1st version Control lever position degrees: 51...59 Testing: 1st rack travel in: 11.90 Speed rpm: 955...965 2nd rack travel in: 4.00 rpm : 1000...1030 Speed 4th rack travel in: 1100 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 17...25 Testina: rpm : 200 Speed Minimum rack trave: 9.50 rpm : 300 Speed Rack travel in mm : 8.00...8.20 CONSTANT REGULATION Speed rpm : 300...450 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 600 Del.quantity cm3/ : 122.0...126.0 1000 s: (119.0...129.0) cm3 : 6.00 1000 s: (8.) Spread **BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.90 Speed rpm : 955...965 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 130.0...150.0 1000 s: (126.0...154.0)

G18

Remarks:

#### Note remarks

Test sheet : BAO 7,1 a Edition : 29.03.89

Replaces

Test oil : ISO-4113

Combination no. : 0 401 846 892

Injection pump

Pump designation : PE6P110A320RS3219 EP type number : 0 411 816 759

Governor

Governor design. : RQV325...1500PA901

Governer no. : 0 421 813 719

Customer-spec. information Customer : BAUDOUIN

Engine : 6F12 SR-SRY

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 40...45

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 008

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70

: (3.55...3.75)

Rack travel in mm : 9.00...12.00

G19

Firing order : 1-4-3-6-5-2

Phasing : 0-75-120-195-240-315

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 1

#### BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 14.30...14.40

Del.quantity cm3/: 21.7...22.0

100 s: (21.4...22.2)

cm3 : 0.4Spread

100 s: (0.7)

rpm : 325.02nd speed Rack travel in mm: 5.1...5.3 Del.quantity cm3/: 2.2...2.7

100 s: (1.9...2.9) cm3 : 0.4Spread

100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm: 325

: 1.00...1.40 travel mm

rpm : 1100 2nd speed : 4.60...5.00 travel mm

rpm : 1500 3rd speed

travel mm : 7.60...7.80

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1650

Rack travel in mm : 7.50...10.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

Aneroid pressure h: 900

: 217.0...220.0 : (214.5...222.5) Del.quantity 1000

: 4.00 Spread cm3

1000 : (7.50)

RATED SPEED

1st version Control lever

position degrees: 49...57

Testing:

1st rack travel in: 13.30

rpm : 1540...1550 Speed

2nd rack travel in: 4.00

Speed rpm : 1680...1710 4th rack travel in: 1800 Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever

position degrees: 12...20

Testing:

Speed : 100 rpm Minimum rack trave: 6.70

Speed rpm

Rack travel in mm : 5.10...5.30

CONSTANT REGULATION

rpm : 370...480 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm Pressure

rpm : 500 hPa : 900 mm : 14.30...14.40 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 13.30...13.40 2nd pressure hPa : 300

Rack travel in m: 13.60...13.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

rpm : 1500 Speed

Del.quantity cm3/: 201.0...208.0 1000 s: (198.5...210.5)

cm3 : 8.00

Spread 1000 s: (11.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 190.0...194.0

1000 s: (187.5...196.5)

BREAKAWAY

G20

1st version

1mm rack travel less than

full load rack tr: 13.30

rpm : 1540...1550 Speed

INTERMEDIATE RATED SPEED Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed

rpm : 100

LOW IDLE

Speed rpm : 325
Rack travel in mm : 5.10...5.30
Del.quantity cm3/ : 22.0...27.0
1000 s: (19.5...29.5)

Spread cm3 : 4.50

1000 s: (7.50)

Remarks:

APPLICATION

Special-purpose vehicle

#### Note remarks

Test sheet : MB 11,0 L 4 Edition : 07.02.89 Replaces : 2.12.88 Test oil : ISO-4113

Combination no. : 0 401 846 897

Injection pump

Pump designation : PE6P12OA320LS3815-13

: 0 411 826 782 EP type number

Governor

Governor design. : RQ300/1050PA840-1 : 0 421 801 418 Governer no.

Customer-spec. information

Customer : DAIMLER-BENZ

Engine : OM 441 A

1st version kW : 191.0 Rated speed : 2100

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

Opening |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0.8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.60...3.70 Prestroke mm

: (3.55...3.75)

Rack travel in mm : 9.00...12.00

Firing order : 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 12.30...12.50

Del.quantity cm3/: 19.0...19.2

100 s: (18.7...19.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm: 5.1...5.4 Del.quantity cm3/: 1.4...2.2

100 s: (1.1...2.5)

cm3 : 0.8 100 s: (1.2) Spread

GUIDE SLEEVE POSITION Control-lever position

Degree: -2 rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 600 Speed Aneroid pressure h: 700

Del.quantity : 190.0...192.0 1000 : (187.0...195.0)

: 5.00 Spread cm3 1000 : (9.00)

#### RATED SPEED

1st version

Setting point:

: 600 rpm Rack travel in mm: 20.0

Testina: 1st rack travel in: 10.70 Speed rpm : 1095...1110 2nd rack travel in: 4.00 Speed rpm : 1165...1195 4th rack travel in: 1250 rpm : 0.00...1.50 Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 5.2 Testina: Speed rpm : 100 Minimum rack trave: 6.60 Speed rpm : 300 Rack travel in mm: 5.10...5.40
Rack travel in mm: 2.00
Speed rpm: 365...405 TORQUE CONTROL Dimension a mm : 0.90 2nd speed rpm: 1050 Rack travel in m: 11.70...11.90 3rd speed rpm : 700 Rack travel in m: 12.70...12.90 Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 rom Pressure hPa : 700 Rack travel mm : 12.30...12.50 Measurement 1/min : 600 Speed 1st pressure hPa : 350 Rack travel in m: 10.30...10.50 2nd pressure hPa : 550 Rack travel in m: 11.90...12.10 3rd pressure hPa : 780 Rack travel in m: 12.40...12.50 \* 4th pressure hPa : 1100 Rack travel in m: 12.65...12.75 5th pressure hPa : -Rack travel in m: 9.60...9.90 START CUT-OUT

1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1100 Speed rpm : 1050
Del.quantity cm3/ : 184.0...187.0
1000 s: (181.0...190.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: 1100 Speed rpm : 700 Del.quantity cm3/: 204.0...208.0 1000 s: (201.0...211.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 129.0...131.0 1000 s: (126.0...134.0) cm3 : 8.00 Spread 1000 s: (-) **BREAKAWAY** 1st version

1mm rack travel less than

full load rack tr: 10.70 rpm : 1095...1110 Speed

STARTING FUEL DELIVERY

rpm : 100 Del.quantity cm3/: 190.0...210.0 1000 s: (186.0...214.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

APPLICATION

Omnibus

Speed

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MAN 14,5 a : 29.03.89 : 11.12.87 Edition Replaces Test oil : ISO-4113 Combination no. : 0 401 848 082 Injection pump Pump designation : PE8P110A52D/5LS851 EP type number : 0 411 818 046 Governor Governor design. : RQ250/1150PA688 : 0 421 801 231 Governer no. Customer-spec. information Customer : MAN Engine : D2848T : 245.0 1st version kW Rated speed : 2300 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder assembly : 0 681 343 009 **Opening** pressure, bar : 172...175 Test Lines : 1 680 750 015 Outside diameter x Wall thickness x Length mm : 6.00X1.50X600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27 : 3.00...3.10 Prestroke mm : (2.95...3.15) Rack travel in mm : 9.00...12.00

Firing order : 8- 7- 2- 6- 3- 5-Phasing : 0-45-90-135-180-225-270-315 Tolerance + - 0 : 0.50 (0.75) Time to cyl. no. : 8 BASIC SETTING 1st speed rpm: 1150 Rack travel in mm : 10.80...10.90 Del.quantity cm3/: 14.3...14.5 100 s: (14.0...14.7) Spread cm3 : 0.4100 s: (0.7) 2nd speed rpm : 250.0 Rack travel in mm : 4.9...5.1 Del.quantity cm3/ : 1.8...2.4 100 s: (1.5...2.6) Spread cm3 : 0.4100 s: (0.7) GUIDE SLEEVE POSITION Control-lever position Degree: -2 rpm : 600 Speed Rack travel in mm : 19.20...20.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1150 Aneroid pressure h: 1000 : 143.0...145.0 Del.quantity 1000 : (140.5...147.5) cm3 : 4.00 Spread 1000 : (7.50) RATED SPEED 1st version Setting point: Speed LDW Rack travel in mm: 20.0 Testing:

1st rack travel in: 9.80

2nd rack travel in: 4.00

Speed

rpm : 1195...1210

G23

rpm : 1280...1310 Speed 4th rack travel in: 1450 rom : 0.00...1.00Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 250 Rack travel in mm: 5.0 Testing: Speed rpm : 100 Minimum rack trave: 6.50 Speed rpm: 250 Rack travel in mm: 4.90...5.10 Rack travel in mm: 2.00 Speed rpm: 310...350 TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 1150
Rack travel in m: 10.80...10.90
2nd speed rpm : 700 Rack travel in m: 10.80...11.00 Aneroid/Altitude Compensator Test

Setting rpm : 500 hPa : 1000 Speed rpm Pressure : 10.80...10.90 Rack travel mm

Measurement 1/min: 500 Speed

1st pressure hPa : -Rack travel in m: 9.60...9.80 2nd pressure hPa : 290
Rack travel in m: 10.50...10.60
3rd pressure hPa : 230
Rack travel in m: 10.00...10.20

START CUT-OUT

1st version

1/min: 170 (190) Speed

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1000 Speed rpm : 700 Del.quantity cm3/: 135.0...141.0 1000 s: (132.0...144.0) Aneroid pressure h: -Speed rpm : 500

Del.quantity cm3/: 108.0...110.0 1000 s: (105.5...112.5) Spread cm3 : 1000 s: (7.50)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 9.80 Speed rpm : 1195...1210

INTERMEDIATE RATED SPEED Rack travel in mm: 4.00

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 190.0...210.0 1000 s: (186.0...214.0)

LOW IDLE

Speed rpm : 250 Rack travel in mm : 4.90...5.10 Del.quantity cm3/: 18.0...24.0 1000 s: (15.5...26.5)

cm3 : 4.50 Spread 1000 s: (7.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : FIA 17,2 b4 Edition : 10.02.89 Replaces Test oil : ISO-4113 Combination no. : 0 401 848 715 Injection pump EP type number : 0 411 828 705 Governor Governor design. : RQ300/1200PA356 Governer no. : 0 421 801 070 Customer-spec. information Customer : IVECO-FIAT Engine : 8280.02.000 1st version kW : 257.4 Rated speed : 2400 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : D 681 443 D22 assembly Openina pressure, bar : 172...175 Test Lines : 1 680 750 060 Outside diameter x Wall thickness : 8.00X2.00X1000 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

Pump designation: PE8P12DA92O/5LS38O4 per values BEGINNING OF DELIVERY Test pressure, bar: 25...27 : 3.50...3.60 Prestroke mm : (3.45...3.65) Rack travel in mm : 9.00...12.00

: 1-8-4-3-6-5-Firing order Phasing : 0-45-90-135-180-225-270-315 : 0.50 (0.75) Tolerance + - 0 Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 1200 Rack travel in mm : 9.30...9.40 Del.quantity cm3/: 17.3...17.7 100 s: (17.0...18.0) Spread cm3 : 0.5 100 s: (0.9) rpm : 300.0 2nd speed Rack travel in mm : 5.9...6.1 Del.quantity cm3/ : 2.8...3.6 100 s: (2.5...3.9) cm3 : 0.8 Spread 100 s: (1.2) GUIDE SLEEVE POSITION Control-lever position Degree: -1 Speed rpm : 650 Rack travel in mm : 15.20...16.40 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1200 Del.quantity : 173.0...177.0 1000 : (170.0...180.0) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Setting point: : 650 Speed rpm : 650 Rack travel in mm : 15.8 Testing: 1st rack travel in: 8.30 Speed rpm : 1245...1260 2nd rack travel in: 4.00 rpm : 1280...1310 Speed

4th rack travel in: 1400

rom : 0.00...1.00Speed

LOW IDLE 1

Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 6.0

Testing:

rpm : 100 Speed Minimum rack trave: 7.50

Speed rpm : 300
Rack travel in mm : 5.90...6.10
Rack travel in mm : 2.00

: 405...445 Speed rpm

TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version 1st speed rpm : 1200 Rack travel in m: 9.30...9.40

2nd speed rpm : 650

Rack travel in m: 9.30...9.50

#### **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 8.30

Speed rpm : 1245...1260

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

#### Note remarks

Test sheet : FIA 17,2 b3 Edition : 10.02.89 : 5.85 Replaces Test oil : ISO-4113

Combination no. : 0 401 848 718

Injection pump

Pump designation: PE8P120A920/5LS3804 EP type number : 0 411 828 705

Governor

Governor design. : RQV300...1200PA357

: 0 421 813 188 Governer no.

Customer-spec. information Customer : IVECO-FIAT

: 8280.02.020 Engine

1st version kW : 257.4 Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 443 022

Openina

pressure, bar : 172...175

Test Lines : 1 680 750 060

Outside diameter x Wall thickness

: 8.00x2.00x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 3.50...3.60 : (3.45...3.65) Prestroke mm

Rack travel in mm : 9.00...12.00

: 1- 8- 4- 3- 6- 5-7- 2 Firing order

Phasing : 0-45-90-135-180-225-

270-315 : 0.50 (0.75) Tolerance + - 0

Time to cyl. no. : 1

#### BASIC SETTING

1st speed rpm: 1200

Rack travel in mm : 9.30...9.40

Del.guantity cm3/: 17.3...17.7

100 s: (17.0...18.0)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.0 2nd speed Rack travel in mm: 5.9...6.1 Del.quantity cm3/: 2.8...3.6 100 s: (2.5...3.9)

Spread cm3 : 0.8100 s: (1.2)

## (B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

: 1.10...1.50 travel mm 2nd speed rpm : 450

travel mm : 2.60...3.30

rpm : 900 3rd speed travel mm : 5.60...6.00

1200 4th speed rpm

: 7.90...8.10 travel mm : 1500 5th speed rpm

travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1230 Speed

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1200 Speed

: 173.0...177.0 Del.quantity

1000 : (170.0...180.0)

cm3 : 5.00 1000 : (9.00) Spread

RATED SPEED

1st version Control lever

position degrees: 54...62

Testing:

1st rack travel in: 8.30 Speed rpm : 1240...1250 2nd rack travel in: 4.00

Speed rpm : 1315...1345 4th rack travel in: 1450

rpm : 0.00...1.00Speed

LOW IDLE 1

Control Lever

position degrees: 8...16

Testing:

Speed rpm : 100 Minimum rack trave: 7.50

Speed rpm : 300 Rack travel in mm : 5.90...6.10

CONSTANT REGULATION

Speed rpm : 340...445

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 8.30

rpm : 1240...1250 Speed

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Note remarks

Test sheet : FIA 17,2 b4 Edition : 10.02.89

Replaces

Test oil : ISO-4113

Combination no. : 0 401 848 719

Injection pump

Pump designation : PE8P120A920/5LS3804

: 0 411 828 705 EP type number

Governor

Governor design. : RQ300/1200PA356 : 0 421 801 070 Governer no.

Customer-spec, information Customer : IVECO-FIAT

: 8280.02.405 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 443 022

: 172...175 pressure, bar

Test Lines : 1 680 750 060

Outside diameter x Wall thickness

x Length mm : 8.00X2.00X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.50...3.60 Prestroke mm

: (3.45...3.65) Rack travel in mm : 9.00...12.00

1-8-4-3-6-5-7-2 Firing order

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1200

Rack travel in mm : 9.30...9.40

Del.quantity cm3/: 17.3...17.7

100 s: (17.0...18.0)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm: 5.9...6.1 Del.quantity cm3/: 2.8...3.6 100 s: (2.5...3.9)

Spread cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 Speed rpm : 650

Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Del.quantity

, : 173.0...177.0 1000 : (170.0...180.0)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed Rack travel in mm: 15.8

Testing:

1st rack travel in: 8.30

rpm : 1245...1260 Speed

2nd rack travel in: 4.00

rpm : 1280...1310 Speed

4th rack travel in: 1400

: 0.00...1.00 Speed rom

H01

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm : 6.0

Testing:

Speed rpm: 100
Minimum rack trave: 7.50
Speed rpm: 300
Rack travel in mm: 5.90...6.10
Rack travel in mm: 2.00

Speed rom : 400...440

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1200 Rack travel in m: 9.30...9.40

2nd speed rpm : 650

Rack travel in m: 9.30...9.50

#### **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 8.30 Speed rpm : 1245...1260 Speed

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

## APPLICATION

Omnibus

#### Note remarks

Test sheet : FIA 17,2 b6 Edition : 10.02.89

Replaces

Test oil : ISO-4113

Combination no. : 0 401 848 731

Injection pump

Pump designation: PE8P120A920/5LS3804

EP type number : 0 411 828 705

Governor

Governor design. : RQV300...1200PA506

: 0 421 813 249 Governer no.

Customer-spec. information

Customer : IVECO-FIAT

: 331.0 : 2400 1st version kW Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 443 022

Opening |

pressure, bar : 172...175

Test Lines : 1 680 750 060

Outside diameter x Wall thickness

x Length mm : 8.00x2.00x1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60

: (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order

: 1-8-4-3-6-5-7-2

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1200

Rack travel in mm : 11.60...11.70

Del.quantity cm3/: 24.3...24.7

100 s: (24.0...25.0)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 300.0 2nd speed Rack travel in mm: 4.9...5.1 Del.quantity cm3/: 1.9...2.5

100 s: (1.6...2.8)

Spread cm3 : 0.8 100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300 : 1.30...1.70 travel mm

2nd speed rpm : 450

2.80...3.40 travel mm

rpm : 900 3rd speed

: 5.50...5.90 rpm : 1200 travel mm

4th speed

: 7.70...7.90 travel mm

rpm : 1500 5th speed

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 Speed rpm : 1250 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 700

: 243.0...247.0 Del.quantity

1000 : (240.0...250.0)

: 5.00 Spread cm3

: (9.00) 1000

#### RATED SPEED

1st version Control Lever

position degrees: 55...63

Testing:

1st rack travel in: 10.60

Speed rpm: 1240...1250
2nd rack travel in: 4.00
Speed rpm: 1360...1390
4th rack travel in: 1500

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 6...14

Testing:

Speed rom : 100 Minimum rack trave: 6.50 Speed rpm : 300

Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

rpm : 310...405 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500 hPa : 700 Pressure

Rack travel mm : 11.60...11.70

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 8.50...8.60

2nd pressure hPa : 435

Rack travel in m: 10.80...10.90

3rd pressure hPa : 350

Rack travel in m: 9.20...9.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 1200 Del.quantity cm3/: 160.0...164.0 1000 s: (157.0...167.0)

**BREAKAWAY** 

H04

1st version 1mm rack travel less than

full load rack tr: 10.60

Speed rpm : 1240...1250

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

#### Note remarks

Test sheet : FIA 17,2 c1 Edition : 10.02.89

Replaces

Test oil : ISO-4113

Combination no. : 0 401 848 736

Injection pump

Pump designation: PE8P120A920/5LS3812

EP type number : 0 411 828 709

Governor

Governor design. : RQV300...1200PA357

: 0 421 813 188 Governer no.

Customer-spec. information

Customer : IVECO-FIAT

: 8281.02.001 Engine

1st version kW : 257.4 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 443 022

**Opening** 

pressure, bar : 172...175

Test lines : 1 680 750 060

Outside diameter x Wall thickness

x Length mm : 8.00x2.00x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

: 3.50...3.60 Prestroke mm

: (3.45.,.3.65)

Rack travel in mm : 9.00...12.00

: 1-8-4-3-6-5-Firing order

H05

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1200

Rack travel in mm : 9.30...9.40

Del.quantity cm3/: 17.3...17.7

100 s: (17.0...18.0)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.0 2nd speed Rack travel in mm: 5.9...6.1 Del.quantity cm3/: 2.8...3.6 100 s: (2.5...3.9)

cm3 : 0.6Spread 100 s: (0.9)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

travel mm : 1.30...1.70 rpm : 450 2nd speed

: 2.70...3.40 travel mm

rpm : 900 3rd speed

: 5.70...6.10 rpm : 1200 travel mm

4th speed

travel mm : 8.20...8.40

5th speed rpm : 1500 : 11.00...12.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1200

Rack travel in mm: 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

: 173.0...177.0 Del.quantity

1000 : (170.0...180.0)

Spread : 5.00 cm3

1000 : (9.00)

#### RATED SPEED

1st version Control lever

position degrees: 55...63

Setting point:

Speed rpm : 1200 Rack travel in mm : 16.5

Testing:

1st rack travel in: 8.30 Speed rpm : 1240...1250 2nd rack travel in: 4.00

Speed rpm : 1305...1335 4th rack travel in: 1450

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 8...16

Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm: 6.0

Testing:

Speed rpm : 100

Minimum rack trave: 7.50

Speed rpm : 300 Rack travel in mm : 5.90...6.10

CONSTANT REGULATION

rpm : 330...430 Speed

#### **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 8.30

rpm : 1240...1250 Speed

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

### Note remarks

Test sheet : MB 14,6 k 8 Edition : 03.03.89 Replaces : 2.12.88 Test oil : ISO-4113

: 0 401 848 762 Combination no.

Injection pump

Pump designation: PE8P120A320LS3807-10

EP type number : 0 411 828 713

Governor

Governor design. : RQV300...1150PA545-7

Governer no. : 0 421 813 595

Customer-spec. information

Customer : DAIMLER-BENZ

Engine : OM 422 A

1st version kW : 243.0 : 2300 Rated speed

## TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.00...4.10 Prestroke mm

: (3.95...4.15)

Rack travel in mm : 9.00...12.00 Firing order : 8-7-2-6-3-5-

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 8

#### BASIC SETTING

1st speed rpm: 1150

Rack travel in mm : 10.70...10.80

Del.quantity cm3/: 15.9...16.1

100 s: (15.6...16.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.0...5.2 Del.quantity cm3/ : 1.2...1.8

100 s: (0.9...2.1)

cm3 : 0.8Spread

100 s: (1.2)

## (B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 300 : 1.40...1.60 travel mm 2nd speed rpm : 800

: 6.00...6.20 travel mm

rpm : 1200 3rd speed

: 8.00...8.50 travel mm

4th speed rpm : 1300

travel mm : 9.70...10.30

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1230

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Speed rpm : 1150 Aneroid pressure h: 700 Rack travel in m: 10.50...10.70 159.0...161.0 1000 : (156.0...164.0) cm3 : 5.00 Del.quantity START CUT-OUT Spread 1/min : 220 (240) Speed 1000 : (9.00) FUEL DELIVERY CHARACTERISTICS RATED SPEED 1st version 1st version Control lever Aneroid pressure h: 700 Speed rpm: 750
Del.quantity cm3/: 173.5...175.5
1000 s: (170.5...178.5) position degrees: 46...54 Testing: 1st rack travel in: 9.70 Spread cm3 : 7.00rpm : 1190...1200 Speed 1000 s: (12.0) 2nd rack travel in: 4.00 Aneroid pressure h: 700 Speed rpm : 1250...1280 Aneroid pressure h: -Speed rpm: 500
Del.quantity cm3/: 138.0...140.0
1000 s: (135.0...143.0)
Spread cm3: 7.00 4th rack travel in: 1400 Speed rpm : 0.00...1.00 LOW IDLE 1 Control lever 1000 s: (12.0) position degrees: 15...23 Testing: BREAKAWAY Speed rom Minimum rack trave: 6.70 1st version : 300 rpm 1mm rack travel less than Rack travel in mm : 5.00...5.20 full load rack tr: 9.70 CONSTANT REGULATION rpm : 1190...1200 Speed rpm : 300...400 Speed STARTING FUEL DELIVERY TORQUE CONTROL Dimension a mm : 0.30 Torque control curve - 1st version Speed rpm : 100 1st speed rpm : 1150 Del.quantity cm3/: 140.0...160.0 Rack travel in m: 10.70...10.80 1000 s: (136.0...164.0) 2nd speed rpm : 750
Rack travel in m: 11.00...11.20
3rd speed rpm : 700
Rack travel in m: 11.00...11.20 Remarks: Aneroid/Altitude Compensator Test 1st version Settina rpm : 500 Speed Pressure hPa :-Rack travel mm : 10.00...10.30 Measurement 1/min: 500 Speed 1st pressure hPa : 450 Rack travel in m: 10.10...10.20 2nd pressure hPa : 500

**HO8** 

#### Note remarks

Test sheet : MB 14,6 k 9 Edition : 03.03.89 Replaces : 2.12.88 Test oil : ISO-4113

Combination no. : 0 401 848 763

Injection pump

Pump designation : PE8P120A320LS3807-10

: 0 411 828 713 EP type number

Governor

Governor design. : RQV300...1150PA545-6

: 0 421 813 594 Governer no.

Customer-spec, information

Customer : DAIMLER-BENZ

Engine : 0M422 LA

1st version kW : 276.0 : 2300 Rated speed

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10

(3.95...4.15)

Rack travel in mm : 9.00...12.00 Firing order : 8-7-2-6-3-5-

Phasina : 0-45-90-135-180-225-

270-315

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm: 1150

Rack travel in mm : 11.50...11.60

Del.quantity cm3/: 17.5...17.7

100 s: (17.2...18.0)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.1...5.3 Del.quantity cm3/: 1.2...2.0 100 s: (0.9...2.3)

cm3 : 0.8Spread

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed travel mm : 1.40...1.60

2nd speed rpm : 800

: 6.00...6.20 travel mm

rpm : 1200 3rd speed

: 8.00...8.50 travel mm

4th speed rpm : 1300

: 9.70...10.30 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1190 Speed

Rack travel in mm: 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150 Aneroid pressure h: 700 : 175.0...177.0 Del.quantity 1000 : (172.0...180.0) : 5.00 Spread cm3 : (9.00) 1000 RATED SPEED 1st version Control Lever position degrees: 49...57 Testing: 1st rack travel in: 10.50 Speed rpm : 1190...1200 2nd rack travel in: 4.00 Speed rpm : 1250...1280 4th rack travel in: 1400 rpm : 0.00...1.00Speed LOW IDLE 1 Control Lever position degrees: 13...21 Testing: Speed : 100 rpm Minimum rack trave: 6.80 Speed : 300 rpm Rack travel in mm : 5.10...5.30 CONSTANT REGULATION rpm : 300...400 Speed TORQUE CONTROL Dimension a mm : 0.30 Torque control curve - 1st version 1st speed rpm : 1150 Rack travel in m: 11.50...11.60 2nd speed rpm : 750 Rack travel in m: 11.80...12.00 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm Pressure hPa : -Rack travel mm : 10.20...10.40 Measurement 1/min: 500 Speed

START CUT-OUT Speed 1/min : 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 : 750 Speed rpm Del.quantity cm3/: 187.0...190.0 1000 s: (184.0...193.0) cm3 : 8.00 1000 s: (12.0) Spread Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 137.0...139.0 1000 s: (134.0...142.0) cm3 : 8.00 Spread 1000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.50 Speed rpm : 1190...1200 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0) Remarks:

1st pressure hPa : 410

2nd pressure hPa : 490

Rack travel in m: 10.50...10.60

Rack travel in m: 11.10...11.30

#### Note remarks

Test sheet : MB 14,7 c 4 Edition : 31.03.89 : 9.10.87 Replaces Test oil : ISO-4113

Combination no. : 0 401 848 789

Injection pump

Pump designation : PE8P110A320LS3842-1

EP type number : 0 411 818 716

Governor

Governor design. : RQ300/1050PA827-3K

Governer no. : 0 421 803 095

Customer-spec. information

Customer : DAIMLER-BENZ

Engine : 0M442

1st version kW : 213.0 : 2100 Rated speed

#### TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 0 681 343 009 assembly

Opening .

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.00...4.10 : (3.95...4.15) Prestroke mm

Rack travel in mm : 9.00...12.00 Firing order : 8-7-2-6-3-5-

4-1

: 0-45-90-135-180-225-Phasing

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 1050

Rack travel in mm : 12.90...13.00

Del.quantity cm3/: 13.2...13.4

100 s: (12.9...13.6)

cm3 : 0.4Spread

100 s: (0.8)

2nd speed rpm : 300.0 Rack travel in mm : 8.8...9.0 Del.quantity cm3/: 1.5...2.1 100 s: (1.2...2.3)

Spread cm3 : 0.4100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 300 : 1.30...1.50 1st speed

travel mm 2nd speed rpm : 500

: 5.50...5.70 travel mm 3rd speed rpm : 900

travel mm : 6.90...7.20

4th speed 1050 rom:

travel mm : 7.60...7.90

5th speed : 1100 man

: 10.10...10.60 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 14.70...15.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Del.quantity : 132.0...134.0 1000 : (129.5...136.5) : 4.00 cm3 Spread 1000 : (8.00)RATED SPEED 1st version Setting point: Speed : 600 rpm Rack travel in mm: 15.2 Testing: 1st rack travel in: 11.90 rpm : 1095...1110 Speed 2nd rack travel in: 4.00 rpm : 1150...1180 Speed 4th rack travel in: 1300 Speed rpm: 0.00...1.50 LOW IDLE 1 Setting point w/out bumper spring : 300 Speed rpm Rack travel in mm: 8.9 Testing: Speed rpm : 200 Minimum rack trave: 10.50 Speed rpm: 300 Rack travel in mm: 8.80...9.00 Rack travel in mm: 2.00 : 450...490 Speed rpm : 550 Speed rpm Maximum rack trave: 1.80 TORQUE CONTROL Dimension a mm : 0.50 Torque control curve - 1st version 1st speed rpm : 1050 Rack travel in m: 12.90...13.00 rpm : 600 2nd speed Rack travel in m: 12.90...13.10 3rd speed rpm : 900 Rack travel in m: 13.40...13.60 FUEL DELIVERY CHARACTERISTICS 1st version : 600 Speed rpm Del.quantity cm3/: 119.0...122.0 1000 s: (116.0...125.0) Spread cm3 : 8.00 1000 s: (11.0) : 900 Speed rpm Del.quantity cm3/: 130.0...134.0 1000 s: (127.0...137.0) Spread cm3 : 8.00 1000 s: (11.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.90

rpm : 1095...1110 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0)

Remarks:

H12

#### Note remarks

Test sheet : MB 14,7 d 5 Edition : 14.04.89 Replaces : 11.11.88 Test oil : ISO-4113

Combination no. : 0 401 848 793

Injection pump

Pump designation : PE8P110A320LS3842 : 0 411 818 714

EP type number

Governor

Governor design. : RQV300..1050PA524-12

Governer no. : 0 421 813 679

Customer-spec. information

Customer : DAIMLER-BENZ

Engine : 0M442

1st version kW : 192.0 Rated speed : 2100

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 0 681 343 009 assembly

Opening |

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.00...4.10 Prestroke mm : (3.95...4.15)

Rack travel in mm : 9.00...12.00 Firing order : 8- 7- 2- 6- 3- 5-

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

#### BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.50...11.60

Del.quantity cm3/: 11.7...11.9

100 s: (11.4...12.1)

cm3 : 0.4Spread

100 s: (0.8)

2nd speed rpm : 300.0 Rack travel in mm : 8.4...8.7 Del.quantity cm3/: 1.5...2.1

100 s: (1.2...2.3)

cm3 : 0.4Spread 100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 300 : 1.20...1.50 1st speed travel mm

rpm : 800 2nd speed : 5.60...6.00 travel mm

rpm : 1110 3rd speed travel mm : 7.80...8.40

rpm : 1150 4th speed

travel mm : 8.80...9.40

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1100

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1050 : 117.0...119.0 Del.quantity 1000 : (114.5...121.5)

cm3 : 4.00 1000 : (8.00) cm3 Spread RATED SPEED 1st version Control Lever position degrees: 48...56 Testing: 1st rack travel in: 10.50 Speed rpm : 1090...1100 2nd rack travel in: 4.00 Speed rpm : 1135...1165 4th rack travel in: 1250 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 18...26 Testing: Speed rpm : 200 Minimum rack trave: 10.50 rpm : 300 Rack travel in mm : 8.40...8.70 CONSTANT REGULATION rpm : 300...450 Speed START CUT-OUT Speed 1/min: 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version rpm\_ : 600 Speed Del.quantity cm3/: 98.0...104.0 1000 s: (95.0...107.0) cm3 : 6.00 Spread 1000 s: (9,00) **BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.50 rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0)

H14

Remarks:

#### Note remarks

Test sheet : MB 14,7 d 6 : 29.03.89 Edition Replaces : 1.7.88 Test oil : ISO-4113

: 0 401 848 795 Combination no.

Injection pump

Pump designation: PE8P110A320LS3842 : 0 411 818 714 EP type number

Governor

Governor design. : RQV300..1050PA884-1

Governer no. : 0 421 813 686

Customer-spec. information

Customer : DAIMLER-BENZ

Engine : OM442

1st version kW : 213.0 Rated speed : 2100

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 0 681 343 009 assembly

Opening .

: 172...175 pressure, bar

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.00...4.10 Prestroke mm : (3.95...4.15)

Rack travel in mm : 9.00...12.00 Firing order : 8-7-2-6-3-5-4-1

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - 6 : 0.50 (0.75)

Time to cyl. no. : 8

#### BASIC SETTING

1st speed rpm: 750

Rack travel in mm : 12.70...12.80

Del.quantity cm3/: 12.6...12.8

100 s: (12.3...13.0)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0Rack travel in mm: 8.4...8.8

Del.quantity cm3/: 1.5...2.1

100 s: (1.2...2.3)

Spread cm3 : 0.4100 s: (0.7)

## (B) Setting of injection pump with governor

#### GUIDE SLEEVE TRAVEL

rpm : 300 : 1.10...1.40 1st speed travel mm

rpm : 800 2nd speed

: 5.80...6.20 travel mm

3rd speed rpm : 1100 travel mm : 8.20...8.60

rpm : 1150 4th speed

: 9.10...9.70 travel mm

## GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1085 Speed

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

: 126.0...128.0 1000 : (123.5...130.5) Del.quantity

Spread : 4.00 cm3 1000 : (7.50) RATED SPEED 1st version Control lever position degrees: 53...61 Testing: 1st rack travel in: 11.70 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 Speed rpm: 1150...1180 4th rack travel in: 1250 rpm : 0.00...1.00 Speed LOW IDLE 1 Control Lever position degrees: 18...26 Testing: Speed : 200 rom Minimum rack trave: 10.00 rpm : 300 Speed Rack travel in mm : 6.80...7.00 CONSTANT REGULATION rpm : 300...400 Speed START CUT-OUT Speed 1/min: 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version rpm : 1050 Speed Del.quantity cm3/: 136.0...140.0 1000 s: (133.0...143.0) Spread cm3 : 7.00 1000 s: (10.0) **BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.70 Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed : 100 rpm Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0)

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Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : DAO 14,5 b : 21.04.89 Edition Replaces Test oil : ISO-4113 Combination no. : 0 401 848 803 Injection pump Pump designation: PE8P120A520/4LS3850 EP type number : 0 411 828 723 Governor Governor design. : RGV250...900PA668-8 Governer no. : 0 421 813 742 Customer-spec. information Customer : DAEWOO Engine : D 2848 TI TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Opening pressure, bar : 207...210 Orifice plate : 0,8 diameter mm Test lines : 1 680 750 067 Outside diameter x Wall thickness x Length mm : 6.00x1.50x1000 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY

Firing order : 8-7-2-6-3-5-Phasina : 0-45-90-135-180-225-270-315 Tolerance + - 0 : 0.50 (0.75) Time to cyl. no. : 8 BASIC SETTING 1st speed rpm: 900 Rack travel in mm: 11.00...11.10 Del.quantity cm3/: 19.9...20.1 100 s: (19.6...20.4) Spread cm3 : 0.5100 s: (0.9) 2nd speed rpm : 300.0
Rack travel in mm : 5.9...6.1
Del.quantity cm3/ : 1.7...2.3 100 s: (1.4...2.6) Spread cm3 : 0.8100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 300 : 1.30...1.70 travel mm rpm : 650 2nd speed travel mm : 5.80...6.20 rpm : 900 3rd speed : 7.80...8.00 travel mm rpm : 1200 4th speed travel mm : 11.00...12.00 GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 940 Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 900 Del.quantity : 199.0...201.0 1000 : (196.0...204.0)

Prestroke mm

Test pressure, bar: 25...27

Rack travel in mm : 9.00...12.00

: 4.00...4.10

: (3.95...4.15)

Spread

cm3

: 5.00

1000 : (9.00)

1st version Control lever

position degrees: 64...72

Testina:

1st rack travel in: 10.00 Speed rpm: 940...950
2nd rack travel in: 4.00
Speed rpm: 1030...1060
4th rack travel in: 1150

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 8...16

Testing:

Speed rpm : 100 Minimum rack trave: 7.50 Speed rpm: 250
Rack travel in mm: 5.90...6.10
Rack travel in mm: 2.00
Speed rpm: (45)

Speed rpm : 415...475

START CUT-OUT

Speed 1/min : 220 (240)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 10.00 Speed rpm : 940...950

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 185.0...205.0 1000 s: (181.0...209.0)

LOW IDLE

rpm : 300 Speed Rack travel in mm : 5.90...6.10

Del.quantity cm3/: 17.0...23.0 1000 s: (14.0...26.0)

Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

APPLICATION

H18

#### BOSCH INJ. PUMP TEST SPECIFICATIONS : 10- 9- 4- 1- 8- 7 - 6- 3- 5- 2 Firing order Note remarks Test sheet : MB 17,4 b Edition : 29.03.89 Phasing : 0-45-72-117-144-189-: 11.85 Replaces 216-261-288-333 Test oil : ISO-4113 Tolerance + - 0 : 0.50 (0.75) Combination no. : 0 401 849 160 Time to cyl. no. : 10 Injection pump BASIC SETTING Pump designation : PE10P100A320LS842 EP type number : 0 411 809 134 1st speed rpm: 1150 Governor Governor design. : RQ300/1150PA187-2R Rack travel in mm : 12.00...12.10 Governer no. : 0 421 801 112 Del.quantity cm3/: 11.5...11.7 Customer-spec. information Customer : DAIMLER-BENZ 100 s: (11.3...11.9) Engine : OM 403 Spread cm3 : 0.3: 259.0 1st version kW 100 s: (0.5) Rated speed : 2300 2nd speed rpm : 300.0TEST BENCH REQUIREMENTS Rack travel in mm : 7.4...7.6 Del.quantity cm3/ : 1.3...1.9 Test oil 100 s: (1.0...2.1) inlet temp. °C : 38...42 cm3 : 0.3Spread 100 s: (0.5) Overflow valve : 1 417 413 025 GUIDE SLEEVE POSITION Control-lever position Inlet press., bar: 1.50 Degree: -1 Speed rpm : 650 Test nozzle holder Rack travel in mm : 13.80...14.60 assembly : 0 681 343 009 FULL LOAD DELIV. AT FULL LOAD STOP Opening . pressure, bar : 172...175 1st version Speed rpm : 1150 : 115.5...117.5 Del.quantity 1000 : (113.5...119.5) Test lines : 1 680 750 015 : 3.00 Spread cm3 Outside diameter 1000 : (5.00) x Wall thickness : 6.00x1.50x600 x Length mm RATED SPEED (A) Injection pump setting values 1st version Insp. values in parentheses Set equal delivery quant. Setting point: per values Speed rpm : 650 Rack travel in mm : 14.2 : 650 BEGINNING OF DELIVERY Test pressure, bar: 25...27 Testing: 1st rack travel in: 11.00 Prestroke mm : 3.20...3.30 rpm : 1195...1210 Speed : (3.35...3.55) 2nd rack travel in: 4.00

Speed

rpm : 1235...1265

Rack travel in mm : 9.00...12.00

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4th rack travel in: 1350 rpm : 0.00...1.50 Speed LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 7.5 Testing: Speed rpm: 100
Minimum rack trave: 9.00
Speed rpm: 300
Rack travel in mm: 7.40...7.60
Rack travel in mm: 2.00 : 410...450 Speed rpm TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 1150 Rack travel in m: 12.00...12.10 2nd speed rpm : 600 Rack travel in m: 12.00...12.20 FUEL DELIVERY CHARACTERISTICS 1st version : 600 Speed rom Del.quantity cm3/: 100.5...105.5 1000 s: (98.5...107.5) Spread cm3: 5.00 1000 s: (7.00) RACK STOP ADJUSTMENT Speed rpm : 650 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.00 rpm : 1195...1210 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 125.0...145.0 1000 s: (121.0...149.0) Remarks:

#### Note remarks

Test sheet : MAN 18,2 c Edition : 07.02.89 : 22.1.88 Replaces Test oil : ISO-4113

Combination no. : 0 401 849 734

Injection pump

Pump designation : PE10P120A520/4LS3843

EP type number : 0 411 829 707

Governor

Governor design. : RQ300/1000PA837 Governer no. : 0 421 801 372

Customer-spec. information Customer : MAN

Engine : D2840LF/460

1st version kW : 338.0 Rated speed : 2000

# TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.90...4.00 (3.85...4.05)

Rack travel in mm : 9.00...12.00

: 10- 9- 4- 1- - 6- 3- 5-Firing order

Phasina : 0-45-72-117-144-189-216-261-288-333

: 0.50 (0.75) Tolerance + - 0

Time to cyl. no. : 10

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm3/: 20.4...20.6

100 s: (20.1...20.9)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm : 6.0...6.2 Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

cm3 : 0.8 Spread 100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2 rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1000

Del.quantity : 204.0...209.0)

Spread cm3

5.00 1000

RATED SPEED

1st version

Setting point:

rpm Rack travel in mm: 20.0

Testing:

1st rack travel in: 10.30 rpm : 1045...1060 Speed 2nd rack travel in: 4.00 Speed rpm : 1125...1155 4th rack travel in: 1250 Speed rpm : 0.00...1.00Speed LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 6.1 Testing: Speed rpm: 100
Minimum rack trave: 7.60
Speed rpm: 300
Rack travel in mm: 6.00...6.20
Rack travel in mm: 2.00
Speed rpm: 365...405 TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 11.80...11.90 2nd speed rpm : 600 Rack travel in m: 11.80...12.00 Aneroid/Altitude Compensator Test 1st version Setting rpm : 500 hPa : 1000 mm : 11.30...11.40 Speed Pressure Rack travel mm Measurement Speed 1/min: 500 1st pressure hPa : -Rack travel in m: 10.10...10.20 2nd pressure hPa : 380 Rack travel in m: 10.40...10.50 3rd pressure hPa : 500 Rack travel in m: 10.90...11.10 START CUT-OUT 1/min : 220 (240) Speed FUEL DELIVERY CHARACTERISTICS

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.30 Speed rpm : 1045...1060

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 190.0...210.0 1000 s: (186.0...214.0)

LOW IDLE

: 300 Speed rpm Rack travel in mm: 6.00...6.20 Del.quantity cm3/: 17.0...23.0 1000 s: (14.0...26.0) Spread cm3 : 8.00 1000 s: (12.00)

Remarks: : MAN-NR. 2-7778

1st version Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 144.0...146.0 1000 s: (141.0...149.0)

#### Note remarks

Test sheet : MAN 18,2 c1 Edition : 07.02.89 Replaces : 22.1.88 Test oil : ISO-4113

Combination no. : 0 401 849 735

Injection pump

Pump designation : PE10P120A520/4LS3843

EP type number : 0 411 829 707

Governor

Governor design. : RQV300...1000PA838

: 0 421 813 585 Governer no.

Customer-spec. information Customer : MAN

Engine : D2840LF/460

: 338.0 1st version kW Rated speed : 2000

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.90...4.00 : (3.85...4.05)

Rack travel in mm : 9.00...12.00

: 10-9-4-1-8-7 -6-3-5-2 Firing order

Phasing : 0-45-72-117-144-189-216-261-288-333

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm3/: 20.4...20.6

100 s: (20.1...20.9)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 6.0...6.2 Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

cm3 : 0.8Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 300 : 1.00...1.40 1st speed travel mm

2nd speed rpm : 500

travel mm : 3.10...3.50 rpm : 850 3rd speed

travel mm : 6.60...6.90

4th speed rpm : 1000

: 7.70...7.90 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1150

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1000

Del.quantity : 204.0...206.0 1000 : (201.0...209.0) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 49...57 Testina: 1st rack travel in: 10.30 Speed rpm: 1040...1050 2nd rack travel in: 4.00 Speed rpm : 1115...1145 4th rack travel in: 1250 rpm : 0.00...1.00 Speed LOW IDLE 1 Control Lever position degrees: 13...21 Testing: Speed rpm : 100 Minimum rack trave: 7.60 rpm : 300 Rack travel in mm : 6.00...6.20 CONSTANT REGULATION Speed rpm : 335...445 Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 500 hPa : 1000 Pressure Rack travel mm : 11.30...11.40 Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 10.10...10.20 2nd pressure hPa : 380 Rack travel in m: 10.40...10.50 3rd pressure hPa : 500 Rack travel in m: 10.90...11.10 START CUT-OUT 1/min: 230 (250) Speed FUEL DELIVERY CHARACTERISTICS 1st version

Aneroid pressure h: Speed rpm : 500
Del.quantity cm3/: 144.0...146.0
1000 s: (141.0...149.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.30 Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 190.0...210.0 1000 s: (186.0...214.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.00...6.20
Del.quantity cm3/ : 17.0...23.0
1000 s: (14.0...26.0)

Spread cm3 : 8.00 1000 s: (12.00)

Remarks:

: MAN-NR. 2-7779

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#### Note remarks

Test sheet : MAN 17,4 c1 Edition : 28.04.89

Replaces

Test oil : ISO-4113

Combination no. : 0 401 849 744

Injection pump

Pump designation : PE10P120A520/4LS3833

EP type number

: 0 411 829 706

Governor

Governor design: RQ750PA663-7 : 0 421 801 331 Governer no.

Customer-spec, information Customer : MAN

Engine : D2840 LE

1st version kW : 352.0 : 1500 Rated speed

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.20...4.30 Prestroke mm : (4.15...4.35)

Rack travel in mm : 9.00...12.00

: 10- 9- 4- 1- 8- 7 - 6- 3- 5- 2 Firing order

: 0-45-72-117-144-189-216-261-288-333 Phasing

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 10

#### BASIC SETTING

1st speed rpm: 700

Rack travel in mm: 12.30...12.40

Del.quantity cm3/: 22.9...23.1

100 s: (22.6...23.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0Rack travel in mm: 6.1...6.3 Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.3)

Spread cm3 : 0.8

100 s: (1.2)

#### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

229.0...231.0 1000 : (226.0...234.0) Del.quantity

: 5.00 Spread cm3

1000 : (9.00)

#### RATED SPEED

#### 1st version

Testing:

1st rack travel in: 11.30 Speed rpm: 750...755 2nd rack travel in: 4.00

rpm : 790...803 Speed

4th rack travel in: 950

rpm : 0.00...1.00Speed

STARTING FUEL DELIVERY

Speed

rpm : 100

Remarks:

: MAN-NR. 2-7975

APPLICATION

Generator set

#### Note remarks

Test sheet : MWM 21,6 a4 Edition : 24.02.89 Replaces : 6.4.88 Test oil : ISO-4113

Combination no. : 0 401 870 091

Injection pump

Pump designation: PE12P12OA520/5RS428-

EP type number : 0 411 820 034

Governor

: RSUV300...900P0A320-Governor design.

Governer no. : 0 421 829 107

Customer-spec. information Customer · MuM

Engine : TBD 234 V12

1st version kW : 600.0 Rated speed : 1800

# TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter

x Wall thickness

x Lenath mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 9.00...12.00 Firing order

: 1- 2- 9- 10- 5- 6-11- 12- 3- 4- 7- 8

Phasing : 0-30-60-90-120-150-180-210-240-270-300-

330

: 0.50 (0.75) Tolerance + - 0

BASIC SETTING

1st speed rom : 750

Rack travel in mm : 13.70...13.80

Del.quantity cm3/: 24.9...25.1

100 s: (24.6...25.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.7...5.9 Del.quantity cm3/ : 2.0...2.6

100 s: (1.7...2.9) cm3 : 0.8

Spread 100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position Degree: -3

Speed rpm: 800 Rack travel in mm: 0.30...0.70

Governor spring pre-tension Click setting x : 3.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Del.quantity : 249.0...251.0 1000 : (246.0...254.0)

: 5.00 Spread cm3

: (9.00) 1000

RATED SPEED

1st version Control Lever

position degrees: 65...73

Testing: 1st rack travel in: 12.70 rpm : 940...950 Speed 2nd rack travel in: 4.00 rpm : 965...995 Speed 4th rack travel in: 1130 rpm : 0.30...1.40 Speed LOW IDLE 1 Control Lever position degrees: 14...22 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 5.3 Speed Rack travel in mm : 5.70...5.90 Rack travel in mm : 2.00 Speed rpm : 320...380 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 900 Rack travel in m: 13.70...13.80 2nd speed rpm : 450 Rack travel in m: 13.70...13.80 3rd speed rpm : 280 Rack travel in m: 14.90...15.50 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.70 rpm : 940...950 Speed STARTING FUEL DELIVERY Speed rpm : 100 LOW IDLE Speed rpm Rack travel in mm: 5.70...5.90 Del.quantity cm3/: 20.0...26.0 1000 s: (17.0...29.0) Spread cm3 : 8.00 1000 s: (12.00) Remarks: APPLICATION

Generator set

#### Note remarks

Test sheet : DAF 8,3 o11 : 21.04.89 Edition : 12.9.86 Replaces Test oil : ISO-4113

Combination no. : 0 401 876 316

Injection pump

Pump designation : PE6P100A720RS447 EP type number : 0 411 806 191

Governor

Governor design. : RSV250...1200P5A509-

: 0 421 833 199 Governer no.

Customer-spec. information Customer : DAF

Engine : DHT 825

: 162.0 1st version kW Rated speed : 2400

# TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30

: (3.15...3.35)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

: 0.30 (0.75) Tolerance + - 0

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.40...11.50

Del.quantity cm3/: 11.8...12.0

100 s: (11.6...12.2)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 250.0 Rack travel in mm : 5.2...5.4 Del.quantity cm3/: 0.8...1.2

100 s: (0.5...1.4) cm3 : 0.3

Spread 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Speed Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 700

: 118.5...120.5 Del.quantity 1000 : (116.5...122.5)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 58...66

Testing:

1st rack travel in: 10.40

Speed rpm : 1240...1250 2nd rack travel in: 4.00

rpm : 1300...1330 Speed

3rd rack travel in: 4.00 rpm : 1325...1355 Speed 4th rack travel in: 1530 Speed rom : 0.30...1.40LOW IDLE 1 Control lever position degrees: 22...30 Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm : 4.8 Speed : 250 rpm Rack travel in mm: 5.20...5.40 Rack travel in mm: 2.00 : 540...640 Speed COM TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 11.60...11.70 2nd speed rpm : 400
Rack travel in m: 11.60...11.80
3rd speed rpm : 300
Rack travel in m: 11.90...12.40 Aneroid/Altitude Compensator Test 1st version Setting nom : 600 hPa : 700 Speed nom Pressure Rack travel mm : 11.40...11.50 Measurement 1/min: 600 Speed 1st pressure hPa : -Rack travel in m: 10.40...10.60 2nd pressure hPa : 315 Rack travel in m: 11.10...11.20 3rd pressure hPa : 225 Rack travel in m: 10.50...10.90 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: rpm : 600 Speed Del.quantity cm3/: 92.5...96.5 1000 s: (90.0...99.0)

full load rack tr: 10.40 Speed rpm : 1240...1250

STARTING FUEL DELIVERY

LOW IDLE

.

Remarks:

J02

BREAKAWAY

1st version

1mm rack travel less than

Note remarks

Test sheet : VOL 7,1 c : 24.02.89 Edition : 12.9.86 Replaces : ISO-4113 Test oil

Combination no. : 0 401 876 321

Injection pump

Pump designation : PE6P110A320RS497 : 0 411 816 165 EP type number

Governor

Governor design. : RSV200...1200P1A374-

Governer no. : 0 421 833 204

Customer-spec. information : VOLVO Customer

Engine : TD71A

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10 : (2.95...3.15)

Rack travel in mm : 9.00...12.00

: 1-5-3-Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 11.80...11.90

Del.quantity cm3/: 11.6...11.8

100 s: (11.3...12.1)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 200.0 Rack travel in mm : 5.4...5.6 Del.quantity cm3/: 1.6...2.2

100 s: (-) cm3 : 0.3Spread 100 s: (0.6)

GUIDE SLEEVE POSITION Control-lever position Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900 Del.quantity : 116.0...118.0 1000 : (113.0...121.0)

: 4.00 Spread cm3 1000 : (7,50)

RATED SPEED

1st version Control Lever

position degrees: 51...59

Testing:

1st rack travel in: 10.80

Speed rpm : 1210...1220

2nd rack travel in: 4.00

rpm : 1240...1270

4th rack travel in: 1410

Speed nom : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 13...21 Setting point w/out bumper spring Speed rpm : 200 Rack travel in mm : 5.0 Speed : 200 rpm Rack travel in mm: 5.40...5.60 Rack travel in mm: 2.00 Speed : 280...340 MC Aneroid/Altitude Compensator Test 1st version Settina Speed : 500 rpm Pressure hPa : 900 Rack travel mm : 11.80...11.90 Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 9.80...10.00 2nd pressure hPa : 675
Rack travel in m: 11.60...11.70
3rd pressure hPa : 200 Rack travel in m: 10.10...10.30 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: -Speed rpm : 700
Del.quantity cm3/: 82.0...85.0
1000 s: (79.0...88.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.80 Speed rpm : 1210...1220 STARTING FUEL DELIVERY

Speed

LOW IDLE

J<sub>04</sub>

rpm : 100 Del.quantity cm3/: 160.0...190.0

Rack travel in mm : 20.00...21.00

1000 s: (160.0...190.0)

Speed rpm : 200
Rack travel in mm : 5.40...5.60
Del.quantity cm3/ : 16.0...22.0
Spread cm3 : 3.00 1000 s: (6.00)

Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm. Permissible alteration from 2.20...2.90

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BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : PEN 6,1 q Test sheet Edition : 10.02.89 Replaces : 9.12.88 Test oil : ISO-4113 Combination no. : 0 401 876 327 Injection pump Pump designation : PE6P110A320RS499 EP type number : 0 411 816 169 Governor Governor design. : RSV325...1400P2A374-: 0 421 833 220 Governer no. Customer-spec. information Customer : VOLVO-PENTA Engine : TAMD61A 1st version kW : 220.0 Rated speed : 2800 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 009 assembly Opening pressure, bar : 172...175 Test lines : 1 680 750 015 Outside diameter x Wall thickness x Length mm : 6.00x1.50x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance + - 0 : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING rpm: 1000 1st speed Rack travel in mm : 11.10...11.20 Del.quantity cm3/: 12.0...12.2 100 s: (11.7...12.5) Spread cm3 : 0.4100 s: (0.7) rpm : 325.0 2nd speed Rack travel in mm : 4.1...4.3 Del.quantity cm3/ : 1.1...1.5 100 s: (0.9...1.7) cm3 : 0.3Spread 100 s: (0.6) GUIDE SLEEVE POSITION Control-lever position Degree: -3 rpm : 800 Speed Rack travel in mm : 0.30...0.70 Governor spring pre-tension Click setting x : 6.00 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1000Aneroid pressure h: 900 1000 : (117.5...125.5) Del.quantity Spread cm3 : 4,00 : (7.50) 1000 RATED SPEED 1st version Control lever position degrees: 50...58

Testing:

1st rack travel in: 10.10

Speed rpm : 1450...1460

J05

Prestroke mm

Test pressure, bar: 25...27

: 2.50...2.60

: (2.45...2.65)

2nd rack travel in: 4.00 rpm : 1530...1560 Speed 4th rack travel in: 1630 Speed rpm : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 13...21 Setting point w/out bumper spring Speed rpm : 325 Rack travel in mm : 3.7 Speed rpm Rack travel in mm: 4.10...4.30 Rack travel in mm: 2.00 Speed rpm: 380...440 Aneroid/Altitude Compensator Test 1st version Setting rpm : 500 hPa : 900 Speed rpm Pressure Rack travel mm : 11.00...11.20 Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 8.50...8.70 2nd pressure hPa : 360
Rack travel in m: 8.70...8.80
3rd pressure hPa : 730
Rack travel in m: 10.70...10..80 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 rpm : 1400 Speed Del.quantity cm3/: 122.5...126.5 1000 s: (119.5...129.5) Aneroid pressure h: rpm\_ : 500 Speed Del.quantity cm3/: 54.5...58.5 1000 s: (51.5...61.5) BREAKAWAY 1st version

1mm rack travel less than

full load rack tr: 10.10 rpm : 1450...1460 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...165.0 1000 s: (-)

LOW IDLE

Speed rpm: 325 Rack travel in mm: 4.10...4.30 Del.quantity cm3/: 11.0...15.0 1000 s: (9.0...17.0) cm3 : 3.00 1000 s: (6.00) Spread

Remarks:

**APPLICATION** 

Navy

Note remarks

Test sheet : ENA 10,1 f : 24.02.89 : 25.3.88 Edition Replaces Test oil : ISO-4113

Combination no. : 0 401 876 332

Injection pump

Pump designation : PE6P100A820LS130 : 0 411 806 179 EP type number

Governor

Governor design. : RSV250...1000P1A532

: 0 421 833 273 Governer no.

Customer-spec, information Customer : ENASA

Engine : 95 T1 AX,

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

: 172...175 pressure, bar

Test Lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 750

Rack travel in mm : 11.90...12.00

Del.quantity cm3/: 11.3...11.5

100 s: (11.1...11.7)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 250.0 Rack travel in mm : 7.9...8.1 Del.quantity cm3/ : 1.8...2.2

100 s: (1.5...2.4)

cm3 : 0.3 Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position Degree: -3

Speed rpm: 800 Rack travel in mm: 0.30...0.70

Governor spring pre-tension Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

1000 : (111.0...117.0) cm3 : 3.50 Del.quantity

Spread

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 40...48

Testina:

1st rack travel in: 10.90 rpm : 790...800 Speed

2nd rack travel in: 4.00

rpm : 825...855 Speed

3rd rack travel in: 4.00

rpm : 835...865

4th rack travel in: 1000

rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 19...27 Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm : 5.5 Testina: Speed rpm : 100 Minimum rack trave: 19.50
Speed rpm: 250
Rack travel in mm: 5.90...6.10
Rack travel in mm: 2.00
Speed rpm: 330...390 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 750 Rack travel in m: 11.90...12.00 2nd speed rpm : 450
Rack travel in m: 11.90...12.00
3rd speed rpm : 290
Rack travel in m: 13.20...13.80 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.90 Speed rpm : 790...800 Speed STARTING FUEL DELIVERY Speed rpm : 100
Del.quantity cm3/ : 260.0...280.0
1000 s: (256.0...284.0)
Rack travel in mm : 19.00...21.00 LOW IDLE Speed rpm : 250 Rack travel in mm : 5.90...6.10 Remarks: APPLICATION Special-purpose vehicle

Note remarks

Test sheet : ENA 10,1 f1 Edition : 24.02.89 Replaces : 7.10.88 Test oil : ISO-4113

Combination no. : 0 401 876 332A

Injection pump

Pump designation : PE6P100A820LS130 : 0 411 806 179 EP type number

Governor

Governor design. : RSV250...1000P1A532

: 0 421 833 273 Governer no.

Customer-spec. information Customer : ENASA

: 95 A1 COMR 400 Engine

: 125.0 1st version kW Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Openina |

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 9.00...12.00

J09

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASTC SETTING

1st speed rpm: 1050

Rack travel in mm : 11.40...11.50

Del.quantity cm3/: 11.0...11.2

100 s: (10.8...11.4)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 250.0 2nd speed Rack travel in mm: 7.9...8.1 Del.quantity cm3/: 1.8...2.2

100 s: (1.5...2.4) Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

: 110.0...112.0 Del.quantity 1000 : (108.0...114.0)

: 3.50 Spread cm3 1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 50...58

Testing:

1st rack travel in: 10.40

rpm : 1060...1065 Speed

2nd rack travel in: 4.00

rpm : 1090...1120 Speed

3rd rack travel in: 4.00 Speed rpm : 1100...1130 4th rack travel in: 1250 rpm : 0.30...1.40 Speed LOW IDLE 1 Control Lever position degrees: 15...23 Setting point w/out bumper spring Speed rpm : 200 Rack travel in mm : 5.5 Testina: Speed rpm : 100 Minimum rack trave: 19.50 rpm : 200 Speed Rack travel in mm: 5.90...6.10
Rack travel in mm: 2.00
Speed rpm: 310...370 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1050 Rack travel in m: 11.40...11.50 2nd speed rpm : 450 Rack travel in m: 11.40...11.50 3rd speed rpm : 250 Rack travel in m: 12.60...13.20 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.40 rpm : 1060...1065 Speed STARTING FUEL DELIVERY LOW IDLE Speed rpm : 200 Rack travel in mm : 5.90...6.10 Remarks:

#### Note remarks

Test sheet : ENA 10,1 f2 Edition : 24.02.89

Replaces

Test oil : ISO-4113

Combination no. : 0 401 876 332B

Injection pump

Pump designation : PE6P100A820LS130 EP type number : 0 411 806 179

Governor

Governor design. : RSV250...1000P1A532

Governer no. : 0 421 833 273

Customer-spec. information Customer : ENASA

Engine : 95 A1 COML 4

1st version kW : 114.0 Rated speed : 2000

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

**Opening** 

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm : (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

#### BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.00...11.10

Del.quantity cm3/: 10.0...10.2

100 s: (9.8...10.4)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 250.0 2nd speed Rack travel in mm: 7.9...8.1 Del.quantity cm3/: 1.8...2.2 100 s: (1.5...2.4)

cm3 : 0.3Spread

100 s: (0.5)

# GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

: 100.0...102.0 Del.quantity 1000 : (98.0...104.0)

Spread cm3 : 3.50

: (6.00) 1000

#### RATED SPEED

1st version Control Lever

position degrees: 49...57

Testing:

1st rack travel in: 10.00

Speed rpm : 1010...1015

2nd rack travel in: 4.00

rpm : 1040...1070 Speed

3rd rack travel in: 4.00 rpm : 1050...1080 Speed 4th rack travel in: 1250 Speed rpm : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 15...23 Setting point w/out bumper spring Speed rpm : 200 Rack travel in mm : 5.5 Testing: Speed rpm : 100 Minimum rack trave: 19.50 rpm : 200 Rack travel in mm: 5.90...6.10 Rack travel in mm: 2.00 Speed rpm: 310...370 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 11.00...11.10 2nd speed rpm : 450 Rack travel in m: 11.00...11.10 3rd speed rpm : 250 Rack travel in m: 12.20...12.80 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.00 rpm : 1010...1015 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 260.0...280.0 1000 s: (256.0...284.0) Rack travel in mm : 19.00...21.00 LOW IDLE Speed rpm : 200 Rack travel in mm : 5.90...6.10 Remarks:

#### Note remarks

Test sheet : ENA 10,1 f3 : 24.02.89 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 401 876 332c

Injection pump

Pump designation : PE6P100A820LS130 EP type number : 0 411 806 179

Governor

Governor design. : RSV250...1000P1A532

: 0 421 833 273 Governer no.

Customer-spec. information Customer : ENASA

: 95 AI COEB 2 Engine

: 113.0 1st version kW Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

**Opening** 

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm : (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 900 1st speed

Rack travel in mm : 11.60...11.70

Del.quantity cm3/: 10.9...11.1

100 s: (10.7...11.3)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 250.0 2nd speed Rack travel in mm: 7.9...8.1 Del.quantity cm3/: 1.8...2.2

100 s: (1.5...2.4) cm3 : 0.3 100 s: (0.5) Spread

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del.quantity : 109.0...111.0 1000 : (107.0...113.0)

Spread : 3.50 cm3

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 44...52

Testing:

1st rack travel in: 10.60 Speed rpm : 905...910 2nd rack travel in: 4.00

rpm : 935...965 Speed

3rd rack travel in: 4.00 rpm : 945...975 Speed 4th rack travel in: 1100 Speed rpm : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 19...27 Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm : 5.5 Testina: Speed rpm Minimum rack trave: 19.50 Speed rpm : 250
Rack travel in mm : 5.90...6.10
Rack travel in mm : 2.00
Speed rpm : 340...400 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 900 Rack travel in m: 11.60...11.70 2nd speed rpm : 450 Rack travel in m: 11.60...11.70 3rd speed rpm : 290 Rack travel in m: 12.80...13.40 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.60 rpm : 905...910 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 260.0...280.0 1000 s: (256.0...284.0) Rack travel in mm : 19.00...21.00 LOW IDLE Speed rpm : 250 Rack travel in mm : 5.90...6.10 Remarks:

#### Note remarks

Test sheet : ENA 10,1 f4 Edition : 24.02.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 401 876 3320

Injection pump

Pump designation : PE6P100A820LS130 EP type number : 0 411 806 179

Governor

Governor design. : RSV250...1000P1A532

Governer no. : 0 421 833 273

Customer—spec. information Customer : ENASA

Engine : 95 A1 COEB 1

1st version kW : 97.0 Rated speed : 2000

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening |

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90

: (2.75...2.95)
Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

#### BASIC SETTING

1st speed rpm: 750

Rack travel in mm : 11.60...11.70

Del.quantity cm3/: 10.7...10.9

100 s: (10.5...11.1)

Spread cm3: 0.3

100 s: (0.6)

2nd speed rpm : 250.0 Rack travel in mm : 7.9...8.1

Del.quantity cm3/: 1.8...2.2

100 s: (1.5...2.4) Spread cm3 : 0.3

100 s: (0.5)

# GUIDE SLEEVE POSITION Control-lever position

Degree: -3

peed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 750

Del.quantity : 107.0...109.0 1000 : (105.0...111.0)

Spread cm3 : 3.50

1000 : (6.00)

#### RATED SPEED

1st version Control lever

position degrees: 38...46

Testing:

1st rack travel in: 10.60

Speed rpm : 755...760 2nd rack travel in: 4.00

nd rack travel in: 4.00 Speed rpm : 780...810

3rd rack travel in: 4.00 Speed rpm : 790...820 4th rack travel in: 1000 Speed

riom : 0.30...1.40

LOW IDLE 1 Control Lever

position degrees: 19...27

Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm : 5.5

Testing:

Speed rpm : 100 Minimum rack trave: 19.50 Speed rpm : 250

Rack travel in mm : 5.90...6.10 Rack travel in mm : 2.00

rpm : 330...390

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 750
Rack travel in m: 11.60...11.70

2nd speed rpm : 450

Rack travel in m: 11.60...11.70

3rd speed rpm : 300

Rack travel in m: 12.80...13.40

# **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 10.60

Speed rom : 755...760

STARTING FUEL DELIVERY

LOW IDLE

Speed rpm : 250 Rack travel in mm : 5.90...6.10

Remarks:

#### Note remarks

: ENA 10,1 f5 : 24.02.89 Test sheet Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 401 876 332E

Injection pump

Pump designation : PE6P100A820LS130 : 0 411 806 179 EP type number

Governor

Governor design. : RSV250...1000P1A532

: 0 421 833 273 Governer no.

Customer-spec. information Customer : ENASA

: 95 T1 ACML 4 Engine

: 158.0 1st version kW Rated speed : 2000

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm : (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasina : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm:950

Rack travel in mm : 14.10...14.20

Del.quantity cm3/: 16.2...16.4

100 s: (16.0...16.6)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0 Rack travel in mm: 7.9...8.1 Del.quantity cm3/: 1.8...2.2 100 s: (1.5...2.4)

cm3 : 0.3 100 s: (0.5) Spread

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 950

Del.quantity : 162.0...164.0 1000 : (160.0...166.0)

: 3.50 Spread cm3 1000

: (6.00)

RATED SPEED

1st version Control lever

position degrees: 47...55

Testina:

1st rack travel in: 13.10 Speed rpm : 960...965

2nd rack travel in: 4.00

rpm : 1000...1030 Speed

3rd rack travel in: 4.00 Speed rpm : 1010...1040 4th rack travel in: 1200 Speed rpm : 0.30...1.40 LOW IDLE 1 Control Lever position degrees: 15...23 Setting point w/out bumper spring Speed rpm : 200 Rack travel in mm : 5.5 Testina: Speed rpm : 100 Minimum rack trave: 19.50 rpm : 200 Rack travel in mm: 5.90...6.10
Rack travel in mm: 2.00
Speed rpm: 320...380 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 950
Rack travel in m: 14.10...14.20
2nd speed rpm : 450
Rack travel in m: 14.10...14.20 3rd speed rpm : 250 Rack travel in m: 15.30...15.90 BREAKAWAY 1st version 1mm rack travel less than

full load rack tr: 13.10 rpm : 960...965 Speed

#### STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 260.0...280.0 1000 s: (256.0...284.0) Rack travel in mm: 19.00...21.00

#### LOW IDLE

Speed rpm : 200 Rack travel in mm : 5.90...6.10

Remarks:

#### Note remarks

Test sheet : ENA 10,1 f6 : 24.02.89 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 401 876 332F

Injection pump

Pump designation : PE6P100A820LS130 EP type number : 0 411 806 179

Governor

Governor design. : RSV250...1000P1A532

: 0 421 833 273 Governer no.

Customer-spec. information Customer : ENASA

Engine : 95 T1 AOEA 2

1st version kW : 147.0 Rated speed : 2000

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm : (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 900

Rack travel in mm : 14.20...14.30

Del.quantity cm3/: 16.3...16.5

100 s: (16.1...16.7)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0 Rack travel in mm: 7.9...8.1 Del.quantity cm3/: 1.8...2.2 100 s: (1.5...2.4)

cm3 : 0.3 Spread 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

: 163.0...165.0 Del.quantity 1000 : (161.0...167.0)

: 3.50 Spread cm3

1000 : (6.00)

## RATED SPEED

1st version Control lever

position degrees: 45...53

Testing:

1st rack travel in: 13.20 Speed rpm : 905...910 2nd rack travel in: 4.00

Speed rpm : 935...965

3rd rack travel in: 4.00 rpm : 945...975 Speed 4th rack travel in: 1150 rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 19...27 Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm : 5.5 Testing: Speed rpm : 100 Minimum rack trave: 19.50 Speed rpm : 250 Rack travel in mm : 5.90...6.10 Rack travel in mm : 2.00 Speed rpm : 340...400 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 900 Rack travel in m: 14.20...14.30 2nd speed rpm : 450 Rack travel in m: 14.20...14.30 3rd speed rpm : 290 Rack travel in m: 15.40...16.00 BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.20 rpm : 905...910 Speed STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 260.0...280.0 1000 s: (256.0...284.0) Rack travel in mm: 19.00...21.00 LOW IDLE Speed rpm : 250 Rack travel in mm : 5.90...6.10 Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : ENA 10,1 f7 Edition : 24.02.89 Replaces Test oil : ISO-4113 Combination no. : 0 401 876 332G Injection pump Pump designation : PE6P100A820LS130 EP type number : 0 411 806 179 Governor Governor design. : RSV250...1000P1A532 : 0 421 833 273 Governer no. Customer-spec. information Customer : ENASA Engine : 95 T1 AOEB 1 : 146.0 1st version kW Rated speed : 2000 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder assembly : 0 681 343 009 **Opening** pressure, bar : 172...175 Test Lines : 1 680 750 015 Outside diameter x Wall thickness x Length mm : 6.00x1.50x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

Firing order : 1-5-3-6-2-4 Phasina : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 750 Rack travel in mm : 14.40...14.50 Del.quantity cm3/: 16.7...16.9 100 s: (16.5...17.1) Spread cm3 : 0.3100 s: (0.6) 2nd speed rpm : 250.0 Rack travel in mm: 7.9...8.1 Del.quantity cm3/: 1.8...2.2 100 s: (1.5...2.4) cm3 : 0.3 100 s: (0.5) Spread GUIDE SLEEVE POSITION Control-lever position Degree: -3 rpm : 800 Rack travel in mm : 0.30...0.70 Governor spring pre-tension Click setting x : 4.50 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 750 Del.quantity : 167.0...169.0 1000 : (165.0...171.0) : 3.50 Spread cm3 1000 : (6,00) RATED SPEED 1st version Control lever position degrees: 39...47 Testing: 1st rack travel in: 13.40 Speed rpm : 755...760

2nd rack travel in: 4.00 Speed rpm : 780...810

BEGINNING OF DELIVERY

per values

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90 : (2.75...2.95)
Rack travel in mm : 9.00...12.00

3rd rack travel in: 4.00 Speed rpm: 790...820 4th rack travel in: 1000 Speed rpm : 0.30...1.40 LOW IDLE 1 Control Lever position degrees: 19...27 Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm : 5.5 Testing: rpm : 100 Speed Minimum rack trave: 19.50 rpm : 250 Rack travel in mm : 5.90...6.10 Rack travel in mm : 2.00 : 330...390 Speed rpm TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 750 Rack travet in m: 14.40...14.50 2nd speed rpm : 450 Rack travel in m: 14.40...14.50 BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.40 rpm : 755...760 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 260.0...280.0 1000 s: (256.0...284.0) Rack travel in mm : 19.00...21.00 LOW IDLE Speed rpm : 250 Rack travel in mm : 5.90...6.10 Remarks:

Note remarks

Test sheet : ENA 10,1 f8 : 24.02.89 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 401 876 332H

Injection pump

Pump designation : PE6P100A820LS130 EP type number : 0 411 806 179

Governor

Governor design. : RSV250...1000P1A532

: 0 421 833 273 Governer no.

Customer-spec. information Customer : ENASA

: 95 A1 COIB 4 Engine

: 120.0 1st version kW Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - 0: 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.80...11.90

Del.quantity cm3/: 11.5...11.7

100 s: (11.3...11.9)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 250.0 2nd speed Rack travel in mm: 7.9...8.1 Del.quantity cm3/: 1.8...2.2 100 s: (1.5...2.4)

cm3 : 0.3 100 s: (0.5) Spread

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

: 115.0...117.0 Del.quantity 1000 : (113.0...119.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version Control Lever

position degrees: 49...57

Testing:

1st rack travel in: 10.80

Speed rpm : 1010...1015

2nd rack travel in: 4.00

rpm : 1040...1070 Speed

3rd rack travel in: 4.00 Speed rpm: 1050...1080 4th rack travel in: 1250 Speed rpm : 0.30...1.40 LOW IDLE 1 Control Lever position degrees: 15...23 Setting point w/out bumper spring Speed rpm : 200 Rack travel in mm : 5.5 Testing: Speed rpm : 100 Minimum rack trave: 19.50 Speed rpm : 200 Rack travel in mm : 5.90...6.10 Rack travel in mm : 2.00 Speed rpm : 310...370 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 11.80...11.90 2nd speed rpm : 450 Rack travel in m: 11.80...11.90 3rd speed rpm : 250 Rack travel in m: 13.00...13.60 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.80 Speed rpm : 1010...1015 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 260.0...280.0 1000 s: (256.0...284.0) Rack travel in mm : 19.00...21.00 LOW IDLE Speed rpm : 200 Rack travel in mm : 5.90...6.10 Remarks:

#### Note remarks

Test sheet Edition

: ENA 10,1 f9 : 24.02.89

Replaces

Test oil

: ISO-4113

Combination no.

: 0 401 876 332K

Injection pump

EP type number

Pump designation : PE6P100A820LS130 : 0 411 806 179

Governor

Governor design. : RSV250...1000P1A532

Governer no.

: 0 421 833 273

Customer-spec, information : ENASA

Customer

Engine

: 95 T1 AOIB 4

1st version kW Rated speed

: 165.0 : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 0 681 343 009

Openina .

pressure, bar

: 172...175

Test Lines

: 1 680 750 015

Outside diameter

x Wall thickness

x Length mm

: 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

J25

Firing order : 1-5-3-6-2-4

Phasina

: 0-60-120-180-240-300

Tolerance + - 0

: 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm: 950

Rack travel in mm : 14.20...14.30

Del.quantity cm3/: 16.3...16.5

100 s: (16.1...16.7)

Spread

2nd speed

cm3 : 0.3

100 s: (0.6)

rpm : 250.0Rack travel in mm: 7.9...8.1

Del.quantity cm3/: 1.8...2.2 100 s: (1.5...2.4)

Spread

cm3 : 0.3 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 950

Del.quantity : 163.0...167.0)

: 3.50 cm3

1000 : (6,00)

RATED SPEED

1st version

Control lever

position degrees: 47...55

Testing:

1st rack travel in: 13.20

Speed rpm : 960...965

2nd rack travel in: 4.00 Speed

rpm : 1000...1030

3rd rack travel in: 4.00 rpm : 1010...1040 Speed 4th rack travel in: 1200 Speed rpm : 0.30...1.40 LOW IDLE 1 Control Lever position degrees: 15...23 Setting point w/out bumper spring Speed rpm : 200 Rack travel in mm : 5.5 Testing: Speed : 100 rpm Minimum rack trave: 19.50 Speed rpm : 200 Rack travel in mm : 5.90...6.10 Rack travel in mm : 2.00 rpm : 320...380 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 950 Rack travel in m: 14.20...14.30 2nd speed rpm : 450 Rack travel in m: 14.20...14.30 3rd speed rpm : 250 Rack travel in m: 15.40...16.00 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.20 rpm : 960...965 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 260.0...280.0 1000 s: (256.0...284.0)

Rack travel in mm: 19.00...21.00

LOW IDLE

Speed rpm : 200 Rack travel in mm : 5.90...6.10

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Firing order : 1-5-3-6-2-4 Note remarks Test sheet Edition : ENA 10,1f10 : 24.02.89 : 0-60-120-180-240-300 Phasing Replaces Tolerance + - 0 : 0.50 (0.75) Test oil : ISO-4113 Time to cyl. no. : 1 Combination no. : 0 401 876 3321 BASIC SETTING Injection pump Pump designation : PE6P100A820LS130 1st speed rpm: 1000 EP type number : 0 411 806 179 Governor Rack travel in mm: 14.10...14.20 Governor design. : RSV250...1000P1A532 Governer no. : 0 421 833 273 Del.quantity cm3/: 16.3...16.5 Customer-spec. information 100 s: (16.1...16.7) Customer : ENASA Spread cm3 : 0.3Engine : 95 T1 AOIR 43 100 s: (0.6) 1st version kW : 166.0 Rated speed : 2000 rpm : 250.0 2nd speed Rack travel in mm: 7.9...8.1 TEST BENCH REQUIREMENTS Del.quantity cm3/: 1.8...2.2 100 s: (1.5...2.4) Test oil cm3 : 0.3Spread inlet temp. °C : 38...42 100 s: (0.5) Overflow valve GUIDE SLEEVE POSITION : 1 417 413 025 Control-lever position Degree: -3 Inlet press., bar: 1.50 rpm : 800 Rack travel in mm : 0.30...0.70 Test nozzle holder assembly : 0 681 343 009 Governor spring pre-tension Click setting x : 4.50 Opening pressure, bar : 172...175 FULL LOAD DELIV. AT FULL LOAD STOP 1st version

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

creates of an income

BEGINNING OF DELIVERY Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90 : (2.75...2.95) Rack travel in mm : 9.00...12.00

1st rack travel in: 13.10

Speed

Spread

Del.quantity

RATED SPEED

1st version

Testing:

Control lever

Speed rpm : 1010...1015 2nd rack travel in: 4.00 Speed rpm : 1045...1075

cm3

1000

position degrees: 49...57

rpm : 1000

: 163.0...165.0

1000 : (161.0...167.0)

: 3.50

: (6.00)

3rd rack travel in: 4.00 Speed rpm : 1055...1085 4th rack travel in: 1250 Speed rpm : 0.30...1.40 LOW IDLE 1 Control Lever position degrees: 15...23 Setting point w/out bumper spring Speed rpm : 200 Rack travel in mm : 5.5 Testing: Speed rpm : 100 Minimum rack trave: 19.50 Speed rpm : 200 Rack travel in mm : 5.90...6.10 Rack travel in mm : 2.00 Speed rpm : 310...370 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 14.10...14.20 2nd speed rpm : 450 Rack travel in m: 14.10...14.20 3rd speed rpm : 250 Rack travel in m: 15.30...15.90 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.10 Speed rpm : 1010...1015 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 260.0...280.0 1000 s: (256.0...284.0) Rack travel in mm : 19.00...21.00 LOW IDLE rpm : 200 Speed Rack travel in mm : 5.90...6.10 Remarks:

### Note remarks

Test sheet : ENA 10,1f11 Edition : 24.02.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 401 876 332M

Injection pump

Pump designation : PE6P100A820LS130 EP type number : 0 411 806 179

Governor

Governor design. : RSV250...1000P1A532

Governer no. : 0 421 833 273

Customer—spec. information Customer : ENASA

Engine : 9105.42.25.43

1st version kW : 132.0 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening.

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 9.00...12.00

K01

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 1

#### BASIC SETTING

1st speed rpm: 900

Rack travel in mm : 11.70...11.80

Del.quantity cm3/: 11.1...11.3

100 s: (10.9...11.5)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0 Rack travel in mm : 7.9...8.1 Del.quantity cm3/ : 1.8...2.2 100 s: (1.5...2.4)

Spread cm3 : 0.3

100 s: (0.5)

# GUIDE SLEEVE POSITION Control-lever position

Degree: -3

peed rpm: 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 900

Del.quantity : 111.0...113.0 1000 : (109.0...115.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version Control lever

position degrees: 47...55

Testing:

1st rack travel in: 10.70 Speed rpm : 965...975

2nd rack travel in: 4.00

Speed rpm : 1000...1030

3rd rack travel in: 4.00 rpm : 1010...1040 Speed 4th rack travel in: 1200 Speed rpm : 0.30...1.40 LOW IDLE 1 Control Lever position degrees: 15...23 Setting point w/out bumper spring Speed rpm : 200 Rack travel in mm : 5.5 Testing: Speed rpm : 100 Minimum rack trave: 19.50 rpm : 200 Rack travel in mm : 5.90...6.10 Rack travel in mm : 2.00 Speed rpm : 320...380 TORQUE CONTROL Torque control curve - 1st version rpm : 900 1st speed Rack travel in m: 11.70...11.80 2nd speed rpm : 450 Rack travel in m: 11.70...11.80 3rd speed rpm : 250 Rack travel in m: 12.90...13.50 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.70 rpm : 965...975 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 260.0...280.0 1000 s: (256.0...284.0) Rack travel in mm : 19.00...21.00 LOW IDLE Speed rpm : 200 Rack travel in mm : 5.90...6.10 Remarks:

#### Note remarks

Test sheet : ENA 10,1f12 Edition : 24.02.89

Replaces

Test oil : ISO-4113

Combination no. : 0 401 876 332N

Injection pump

Pump designation : PE6P100A820LS130 EP type number : 0 411 806 179

Governor

Governor design. : RSV250...1000P1A532

: 0 421 833 273 Governer no.

Customer-spec. information Customer : ENASA

Engine : 9100.14.25.32

: 125.0 1st version kW Rated speed : 2000

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00X1.50X600 x Lenath mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 9.00...12.00

KOB

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rom : 1000

Rack travel in mm : 11.60...11.70

Del.quantity cm3/: 11.0...11.2

100 s: (10.8...11.4)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 250.0 2nd speed Rack travel in mm : 7.9...8.1 Del.quantity cm3/: 1.8...2.2 100 s: (1.5...2.4)

cm3 : 0.3 Spread 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 110.0...112.0 1000 : (108.0...114.0)

: 3.50 Spread cm3

1000 : (6.00)

## RATED SPEED

1st version Control lever

position degrees: 49...57

Testina:

1st rack travel in: 10.60

rpm : 1010...1020 Speed

2nd rack travel in: 4.00

rpm : 1045...1055 Speed

3rd rack travel in: 4.00 Speed rpm : 1055...1085 4th rack travel in: 1250 Speed rpm : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 19...27 Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm : 5.5 Testing: Speed rpm : 100 Minimum rack trave: 19.50 Speed rpm : 250 Rack travel in mm : 5.90...6.10 Rack travel in mm : 2.00 rpm : 340...400 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 11.60...11.70 2nd speed rpm : 450 Rack travel in m: 11.60...11.70 3rd speed rpm : 250 Rack travel in m: 12.80...13.40 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.60 Speed rpm : 1010...1020 STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 260.0...280.0 1000 s: (256.0...284.0) Rack travel in mm: 19.00...21.00 LOW IDLE Speed rpm Rack travel in mm : 5.90...6.10 Remarks:

### Note remarks

Test sheet : ENA 10,1f13 Edition : 24.02.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 401 876 332R

Injection pump

Pump designation : PE6P100A820LS130 EP type number : 0 411 806 179

Governor

Governor design. : RSV250...1000P1A532

Governer no. : 0 421 833 273

Customer—spec. information Customer : ENASA

Engine : 9100.04

1st version kW : 107.0 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

**Opening** 

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 9.00...12.00

K05

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 1

#### BASIC SETTING

1st speed rpm: 900

Rack travel in mm : 11.40...11.50

Del.quantity cm3/: 10.4...10.6

100 s: (10.2...10.8)

Spread cm3: 0.3

100 s: (0.6)

2nd speed rpm : 250.0 Rack travel in mm : 7.9...8.1 Del.quantity cm3/ : 1.8...2.2 100 s: (1.5...2.4)

Spread cm3: 0.3

100 s: (0.5)

# GUIDE SLEEVE POSITION Control-lever position

Degree: -3 d rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 900

Del.quantity : 104.0...106.0 1000 : (102.0...108.0)

Spread cm3 : 3.50 1000 : (6.00)

## RATED SPEED

1st version Control lever

position degrees: 44...52

Testing:

1st rack travel in: 10.40 Speed rpm: 915...925 2nd rack travel in: 4.00

2nd rack travel in: 4.00 Speed rpm : 950...960

3rd rack travel in: 4.00 Speed rpm : 960...990 4th rack travel in: 1150 Speed rpm : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 19...27 Setting point w/out bumper spring rpm : 250° Rack travel in mm: 5.5 Testing: Speed rpm : 100 Minimum rack trave: 19.50 Speed rpm : 250 Rack travel in mm : 5.90...6.10 Rack travel in mm : 2.00 : 340...400 Speed rom TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 900 Rack travel in m: 11.40...11.50 2nd speed rpm : 450 Rack travel in m: 11.40...11.50 3rd speed rpm : 250 Rack travel in m: 12.60...13.20 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.40 rpm : 915...925 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 260.0...280.0 1000 s: (256.0...284.0) Rack travel in mm: 19.00...21.00 LOW IDLE Speed rpm : 250 Rack travel in mm : 5.90...6.10

Remarks:

Note remarks

Test sheet : ENA 10,1f14 Edition : 24.02.89

Replaces

Test oil : ISO-4113

Combination no. : D 401 876 332S

Injection pump

Pump designation : PE6P100A820LS130 : 0 411 806 179 EP type number

Governor

Governor design. : RSV250...1000P1A532

Governer no. : 0 421 833 273

Customer-spec. information Customer : ENASA

Engine : 9105.05

1st version kW : 86.0 : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

**Opening** 

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm : (2.75...2.95)

Rack travel in mm : 9.00...12.00

**K07** 

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 750

Rack travel in mm : 12.10...12.20

Del.quantity cm3/: 11.6...11.8

100 s: (11.4...12.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0 Rack travel in mm : 7.9...8.1 Del.quantity cm3/: 1.8...2.2

100 s: (1.5...2.4) Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Del.quantity : 116.0...118.0 1000 : (114.0...120.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 38...46

Testing:

1st rack travel in: 11.10 Speed rpm : 760...770

2nd rack travel in: 4.00

Speed rpm : 775...805

3rd rack travel in: 4.00 rpm : 785...815 Speed 4th rack travel in: 1000 Speed rpm : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 19...27 Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm : 5.5 Testina: Speed rpm : 100 Minimum rack trave: 19.50 Speed rpm: 250
Rack travel in mm: 5.90...6.10
Rack travel in mm: 2.00
Speed rpm: 330...390 TORQUE CONTROL Torque control curve - 1st version rpm : 750 1st speed Rack travel in m: 12.10...12.20 2nd speed rpm : 450 Rack travel in m: 12.10...12.20 3rd speed rpm : 290 Rack travel in m: 13.30...13.90 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.10 Speed rpm : 760...770 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 260.0...280.0 1000 s: (256.0...284.0) Rack travel in mm: 19.00...21.00 LOW IDLE Speed rpm : 250 Rack travel in mm : 5.90...6.10 Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

Test sheet : ENA 10,1f15 Edition : 24.02.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 401 876 332T

Injection pump

Pump designation: PE6P100A820LS130 EP type number: 0 411 806 179

Governor

Governor design. : RSV250...1000P1A532

Governer no. : 0 421 833 273

Customer—spec. information Customer : ENASA

Engine : 9109.04

1st version kW : 140.0 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

**Opening** 

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90

: (2.75...2.95)
Rack travel in mm: 9.00...12.00

K09

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyi. no. : 1

BASIC SETTING

1st speed rpm: 900

Rack travel in mm : 13.20...13.30

Del.quantity cm3/: 14.2...14.4

100 s: (14.0...14.6)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0 Rack travel in mm : 7.9...8.1 Del.quantity cm3/: 1.8...2.2

100 s: (1.5...2.4) Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm: 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 900

Del.quantity : 142.5...144.5 1000 : (140.5...146.5)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 44...52

Testing:

1st rack travel in: 12.00 Speed rpm : 915...925

2nd rack travel in: 4.00 Speed rpm : 945...975

3rd rack travel in: 4.00 rpm : 955...985 Speed 4th rack travel in: 1150 Speed rpm : 0.30...1.40 LOW IDLE 1 Control Lever position degrees: 19...27 Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm : 5.5 Testing: Speed rpm : 100 Minimum rack trave: 19.50 rpm : 250 Rack travel in mm : 9.40...6.10 Rack travel in mm : 2.00 Speed rpm : 340...400 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 900 Rack travel in m: 13.20...13.30 rpm : 450 2nd speed Rack travel in m: 13.20...13.30 3rd speed rpm : 250 Rack travel in m: 14.40...15.00 BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.00 rom : 915...925 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 260.0...280.0 1000 s: (256.0...284.0) Rack travel in mm : 19.00...21.00 LOW IDLE Speed rpm Rack travel in mm : 5.90...6.10 Remarks:

Note remarks

Test sheet : ENA 11,9 g1 Edition : 17.02.89

Replaces

Test oil : ISO-4113

: 0 401 876 333A Combination no.

Injection pump

Pump designation : PE6P12OA32ORS257 EP type number : 0 411 826 075

Governor

Governor design. : RSV250...1100P0A533

Governer no. : 0 421 833 274

Customer-spec. information Customer : ENASA

Engine : 96 T1AO

: 240.0 1st version kW Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Openina .

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90 : (2.75...2.95) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

Phasina : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1100 1st speed

Rack travel in mm : 11.80...11.90

Del.quantity cm3/: 22.9...23.1

100 s: (22.6...23.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0Rack travel in mm : 5.7...5.9 Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6) cm3 : 0.8

Spread 100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

Del.quantity : 229.0...231.0 1000 : (226.0...234.0)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 41...49

Testina:

1st rack travel in: 10.80

rpm : 1115...1120 Speed 2nd rack travel in: 4.00 rpm : 1160...1190 Speed 3rd rack travel in: 4.00 Speed rpm : 1170...1200 4th rack travel in: 1350 Speed rpm : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 17...25 Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm : 5.3 Testing: Speed rpm : 100 Minimum rack trave: 19.50 Speed rpm : 250
Rack travel in mm : 5.70...5.90
Rack travel in mm : 2.00 Speed : 350...410 Libili TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 11.80...11.90 2nd speed rpm : 450 Rack travel in m: 11.80...11.90 3rd speed rpm : 250 Rack travel in m: 13.00...13.60 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.80 Speed rpm : 1115...1120 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 140.0...160.0 1000 s: (136.0...164.0) Rack travel in mm : 19.50...21.00 Remarks: APPLICATION Special-purpose vehicle

Note remarks

Test sheet

: ENA 11,9 g2

Edition

: 17.02.89

Replaces

Test oil

: ISO-4113

Combination no.

: 0 401 876 333B

Injection pump

Pump designation : PE6P120A320RS257

EP type number Governor

: 0 411 826 075

Governor design. : RSV250...1100POA533

Governer no.

: 0 421 833 274

Customer

Customer-spec. information : ENASA

Engine

: 96 T1A0

1st version kW

: 228.0

Rated speed

: 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 1 688 901 019

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm

: 0.8

Test lines

: 1 680 750 067

Outside diameter

x Wall thickness

x Length mm

: 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Phasing

Prestroke mm

: 0-60-120-180-240-300

Tolerance + - 0

: 0.50 (0.75)

: 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 9.00...12.00 Firing order : 1-5- 3- 6- 2- 4

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm : 1100

Rack travel in mm : 11.60...11.70

Del.quantity cm3/: 22.3...22.5

100 s: (22.0...22.8)

Spread

cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0 Rack travel in mm : 5.7...5.9 Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

Spread

cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1100

Del.quantity : 223.0...225.0

1000 : (220.0...228.0)

Spread

cm3

: 5.00 : (9.00) 1000

RATED SPEED

1st version

Control lever

position degrees: 41...49

Testina:

1st rack travel in: 10.60

K13

Speed rpm : 1110...1115 2nd rack travel in: 4.00 rpm : 1150...1180 Speed 3rd rack travel in: 4.00 Speed rpm : 1160...1190 4th rack travel in: 1350 rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 17...25 Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm : 5.3 Testing: Speed rpm : 100 Minimum rack trave: 19.50 rpm : 250 Rack travel in mm : 5.70...5.90
Rack travel in mm : 2.00
Speed rpm : 350...410 TORQUE CONTROL Dimension a mm : 2.30 Torque control curve - 1st version rpm : 1100 1st speed Rack travel in m: 11.60...11.70 2nd speed rpm : 450 Rack travel in m: 11.60...11.70 3rd speed rpm : 250 Rack travel in m: 12.80...13.40 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.60 rpm : 1110...1115 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0) Rack travel in mm: 19.50...21.00 Remarks: **APPLICATION** Special-purpose vehicle

Note remarks

: ENA 11,9 g3 Test sheet Edition : 17.02.89

Replaces

Test oil : ISO-4113

Combination no. : 0 401 876 333C

Injection pump

Pump designation : PE6P120A320RS257 EP type number : 0 411 826 075

Governor

Governor design. : RSV250...1100P0A533

Governer no. -: 0 421 833 274

Customer-spec. information Customer : FNASA

Engine : 96 T1AO

1st version kW : 209.0 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 9.00...12.00 : 1-5- 3- 6- 2- 4 Firing order

Phasina : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 900

Rack travel in mm : 12.20...12.30

Del.quantity cm3/: 23.7...23.9

100 s: (23.4...24.2)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 250.0 2nd speed Rack travel in mm: 5.7...5.9 Del.quantity cm3/: 1.7...2.3 100 s: (1.4...2.6)

cm3 : 0.8 100 s: (1.2) Spread

GUIDE SLEEVE POSITION Control-lever position Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 900 Speed

Del.quantity : 237.0...242.0)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 36...44

Testing:

1st rack travel in: 11.20

K15

rpm : 905...910 Speed 2nd rack travel in: 4.00 rpm : 960...990 Speed 3rd rack travel in: 4.00 rpm : 970...1000 Speed 4th rack travel in: 1150 Speed rpm : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 17...25 Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm : 5.3 Testing: Speed rpm : 100 Minimum rack trave: 19.50 Speed rpm: 250
Rack travel in mm: 5.70...5.90
Rack travel in mm: 2.00 rpm : 350...410 Speed TORQUE CONTROL Dimension a mm : 2.30 Torque control curve - 1st version rpm : 900 1st speed Rack travel in m: 12.20...12.30 2nd speed rpm : 450 Rack travel in m: 12.20...12.30 3rd speed rpm : 290 Rack travel in m: 13.40...14.00 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.20 Speed rpm : 905...910 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0) Rack travel in mm: 19.50...21.00 Remarks: **APPLICATION** Special-purpose vehicle

Note remarks

: ENA 11,9 g4 Test sheet : 17.02.89 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 401 876 333b

Injection pump

Pump designation: PE6P120A320RS257 EP type number : 0 411 826 075

Governor

Governor design. : RSV250...1100P0A533

: 0 421 833 274 Governer no.

Customer-spec. information Customer : ENASA

Engine : 96 T1AD

: 195.0 1st version kW : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 750 1st speed

Rack travel in mm : 12.50...12.60

Del.quantity cm3/: 23.7...23.9

100 s: (23.4...24.2)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 250.0 Rack travel in mm : 5.7...5.9 Del.quantity cm3/ : 1.7...2.3 100 s: (1.4...2.6)

cm3 : 0.8

Spread 100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 750 Speed

: 237.0...239.0 Del.quantity

1000 : (234.0...242.0) : 5.00 cm3

Spread 1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 32...40

Testing:

1st rack travel in: 11.50

: 755...760 Speed rpm 2nd rack travel in: 4.00 rpm : 820...850 Speed 3rd rack travel in: 4.00 rpm : 830...860 Speed 4th rack travel in: 1000 rpm : 0.30...1.40Speed LOW IDLE 1 Control Lever position degrees: 17...25 Setting point w/out bumper spring

Speed rpm : 250 Rack travel in mm : 5.3

Testing:

Speed rpm : 100 Minimum rack trave: 19.50 rpm : 250 Speed Rack travel in mm : 5.70...5.90
Rack travel in mm : 2.00
Speed rpm : 350...410

TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 750 Rack travel in m: 12.50...12.60 2nd speed rpm : 450

Rack travel in m: 12.50...12.60 3rd speed rpm : 300 Rack travel in m: 13.70...14.30

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.50 Speed rpm : 755...760

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0) Rack travel in mm : 19.50...21.00

Remarks:

**APPLICATION** 

Special-purpose vehicle

Note remarks

Test sheet : ENA 11,9 g5 Edition : 17.02.89

Replaces

Test oil : ISO-4113

Combination no. : 0 401 876 333E

Injection pump

Pump designation : PE6P120A320RS257 EP type number : 0 411 826 075

Governor

Governor design. : RSV250...1100P0A533

Governer no. : 0 421 833 274

Customer-spec, information Customer : ENASA

: 96 T1AD Engine

1st version kW : 220.0 : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Openina .

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

Phasina : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm: 11.70...11.80

Del.quantity cm3/: 22.3...22.5

100 s: (22.0...22.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0 Rack travel in mm : 5.7...5.9 Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

cm3 : 0.8Spread

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm: 800 Rack travel in mm: 0.30...0.70

Governor spring pre-tension Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

223.0...225.0 1000 : (220.0...228.0) Del.quantity

: 5.00

Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 37...45

Testing:

1st rack travel in: 10.70

rpm : 1010...1015 Speed 2nd rack travel in: 4.00 rpm : 1050...1080 Speed 3rd rack travel in: 4.00 Speed rpm : 1060...1090 4th rack travel in: 1250 rom : 0.30...1.40Speed LOW IDLE 1 Control lever position degrees: 17...25 Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm : 5.3 Testina: rpm : 100 Speed Minimum rack trave: 19.50 Speed rpm : 250
Rack travel in mm : 5.70...5.90
Rack travel in mm : 2.00
Speed rpm : 350...410 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 11.70...11.80 2nd speed rpm : 450 Rack travel in m: 11.70...11.80 3rd speed rpm : 250 Rack travel in m: 12.90...13.50 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.70 rpm : 1010...1015 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0) Rack travel in mm : 19.50...21.00 Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : ENA 11,9 g6 Edition : 17.02.89 Replaces Test oil : ISO-4113 Combination no. : 0 401 876 333F Injection pump Pump designation: PE6P120A320RS257 EP type number : 0 411 826 075 Governor Governor design. : RSV250...1100P0A533 : 0 421 833 274 Governer no. Customer-spec. information Customer : ENASA Engine : 96 T1AD : 221.0 : 2200 1st version kW Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder assembly : 1 688 901 019 Opening .

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27 Prestroke mm : 2.80...2.90 : (2.75...2.95) Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order

Phasina : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 11.20...11.30

Del.quantity cm3/: 21.2...21.4

100 s: (20.9...21.7)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0 Rack travel in mm : 5.7...5.9 Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

cm3 : 0.8 Spread 100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting  $\bar{x}$ : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1000 / : 212.0...214.0 10<u>0</u>0 : (209.0...217.0) Del.quantity

Spread cm3 : 5.00 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 37...45

Testina:

1st rack travel in: 10.20

rpm : 1010...1020 Speed 2nd rack travel in: 4.00 rpm : 1050...1060 Speed 3rd rack travel in: 4.00 rpm : 1060...1090 Speed 4th rack travel in: 1250 Speed rpm : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 17...25 Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm : 5.3 Testina: rpm : 100 Speed Minimum rack trave: 19.50 Speed rpm : 250
Rack travel in mm : 5.70...5.90
Rack travel in mm : 2.00
Speed rpm : 350...410 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 11.20...11.30 2nd speed rpm : 450 Rack travel in m: 11.20...11.30 3rd speed rpm : 250 Rack travel in m: 12.40...13.00 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.20 rpm : 1010...1020 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0) Rack travel in mm : 19.50...21.00 Remarks: APPLICATION Special-purpose vehicle

Note remarks

Test sheet Edition

: PEN 12,2 b 31.03.89 9.12.88

Replaces Test oil

: ISO-4113

Combination no.

: 0 401 876 761

Injection pump

EP type number

Pump designation : PE6P120A320RS3206 : 0 411 826 773

Governor

Governor design.: RSV250...900P4A374-6

: 0 421 833 283 Governer no.

Customer-spec. information

Customer

: VOLVO-PENTA

Engine

: TAMD122 A

1st version kW

: 280.0

: 1800 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 3.50...3.60 (3.45...3.65)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance + - 0

: 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm: 700

Rack travel in mm : 11.70...11.80

Del.quantity cm3/: 27.5...27.7

100 s: (27.2...28.0)

Spread

cm3 : 0.5

100 s: (0.9)

rpm : 250.0

2nd speed Rack travel in mm : 5.0...5.2 Del.quantity cm3/: 1.7...2.3

100 s: (1.4...2.6)

Spread

cm3 : 0.5

100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...1.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 700

Aneroid pressure h: 900

Del.quantity

: 275.5...277.5 1000 : (272.5...280.5)

Spread

cm3 1000

5.00 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 50...58

Testing:

1st rack travel in: 10.70

Speed rpm : 925...935

2nd rack travel in: 4.00

rpm : 985...1015 Speed 3rd rack travel in: 4.00 rpm : 995...1025 Speed 4th rack travel in: 1130 Speed rpm : 0.30...1.40 LOW IDLE 1

Control Lever position degrees: 18...26 Setting point w/out bumper spring rpm : 250 Speed Rack travel in mm: 4.6

rpm : 250 Speed

Rack travel in mm : 5.00...5.20 Rack travel in mm : 2.00 : 380...440 Speed COM

Aneroid/Altitude Compensator Test

1st version Setting Speed : 700 rpm Pressure hPa : 900

Rack travel mm : 11.70...11.80

Measurement 1/min: 700 Speed

1st pressure hPa : -Rack travel in m: 8.60...8.80

2nd pressure hPa : 240

Rack travel in m: 8.90...9.00

3rd pressure hPa : 770

Rack travel in m: 11.30...11.60

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: -Speed rpm : 700 Del.quantity cm3/ : 177.0...179.0

1000 s: (174.0,..182.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.70 Speed rpm : 925...935

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 260.0...280.0 1000 s: (250.0...290.0)

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.00...5.20
Del.quantity cm3/: 17.0...23.0
1000 s: (14.0...26.0)
Spread cm3 : 5.00

1000 s: (7.00)

Remarks:

Delivery-valve spring pre-tension =

2.40...2.60 mm.

Permissible alteration from 2.20...2.90

K24

BOSCH INJ. PUMP TEST SPECIFICATIONS : 3.50...3.60 : (3.45...3.65) Prestroke mm Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Note remarks Test sheet : PEN 12,2 b1 Edition : 11.11.88 Replaces Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 401 876 761A Tolerance  $+ - \circ : 0.50 (0.75)$ Injection pump Time to cyl. no. : 1 Pump designation : PE6P120A320RS3206 EP type number : 0 411 826 773 BASIC SETTING Governor Governor design. : RSV250...900P4A374-6 1st speed rom: 700 Governer no. : 0 421 833 283 Rack travel in mm : 12.10...12.20 Customer—spec. information Customer : VOLVO-PENTA Del.quantity cm3/: 29.0...29.2 Engine : TAMD122 A 100 s: (28.7...29.5) : 280.0 1st version kW Spread cm3 : 0.5Rated speed : 1800 100 s: (0.9) TEST BENCH REQUIREMENTS 2nd speed rpm : 250.0 Rack travel in mm: 5.0...5.2 Del.quantity cm3/: 1.7...2.3 100 s: (1.4...2.6) Test oil inlet temp. °C : 38...42 Overflow valve cm3 : 0.5 Spread : 1 417 413 025 100 s: (0.7) Inlet press., bar: 1.50 GUIDE SLEEVE POSITION Control-lever position Test nozzle holder Degree: -3 assembly : 1 688 901 019 rpm : 800 Speed Rack travel in mm : 0.30...1.40 Opening | pressure, bar : 207...210 FULL LOAD DELIV. AT FULL LOAD STOP Orifice plate 1st version diameter mm : 0,8 rpm : 700 Speed Aneroid pressure h: 1200 Del.quantity : 290.3....295.5) Test lines : 1 680 750 067 cm3 : 5.00 1000 : (9.00) Outside diameter x Wall thickness x Length mm RATED SPEED

: 6.00X1.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27 position degrees: 54...62

Testing:

1st version

Control lever

1st rack travel in: 11.10

Speed rpm : 1020...1030 2nd rack travel in: 4.00

Speed rpm : 1080...1110

3rd rack travel in: 4.00

Speed rpm : 1090...1120

4th rack travel in: 1160

Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever

position degrees: 18...26

Setting point w/out bumper spring

Speed rpm : 250

Rack travel in mm : 4.6

Speed rpm : 250

Rack travel in mm : 2.00 Speed rpm : 380...440

Rack travel in mm : 4.50...4.70

Aneroid/Altitude Compensator Test

1st version
Setting
Speed rom : 700
Pressure hPa : 1200

Rack travel mm : 12.10...12.20

Measurement Speed 1/min: 700

1st pressure hPa : Rack travel in m: 8.60...8.80

2nd pressure hPa : 360 Rack travel in m: 8.90...9.00

3rd pressure hPa : 1030

Rack travel in m: 11.70...12.00

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: Speed rpm : 700
Del.quantity cm3/ : 177.0...179.0
1000 s: (174.0...182.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.10 Speed rpm : 1020...1030

STARTING FUEL DELIVERY

Speed rpm: 100

Del.quantity cm3/: 290.0...310.0 1000 s: (280.0...320.0)

Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm.
Permissible alteration from 2.20...2.90 mm

Note remarks

Test sheet : PEN 7,1 c 2 Edition : 07.02.89

Replaces

Test oil : ISO-4113

Combination no. : 0 401 876 768

Injection pump

Pump designation : PE6P110A320RS3147 EP type number : 0 411 816 743

Governor

Governor design. : RSV650...750P4A421-6

Governer no. : 0 421 833 309

Customer-spec. information

Customer : VOLVO-PENTA

Engine : TID 71AG

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening |

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.50...3.60 Prestroke mm

: (3.45...3.65)

Rack travel in mm: 9.00...12.00

Firing order: 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 11.50...11.60

Del.quantity cm3/: 16.4...16.6

100 s: (16.1...16.9)

cm3 : 0.4Spread

100 s: (0.7)

2nd speed rpm : 650.0Rack travel in mm: 4.0...4.2 Del.quantity cm3/: 1.7...2.1

100 s: (1.4...2.3)

cm3 : 0.3 Spread

100 s: (0.6)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

: 164.0...166.0 Del.quantity 1000 : (161.0...169.0)

cm3 Spread : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever

position degrees: 37...45

Testina:

1st rack travel in: 10.50 rpm : 747...752 Speed

2nd rack travel in: 4.00 : 777...790 Speed rpm

4th re travel in: 930

: 0.30...1.40 Speea man

LOW IDLE 1 Control lever position degrees: 31...39 Setting point w/out bumper spring Speed rpm : 650 Rack travel in mm: 4.1 : 650 Speed rpm Rack travel in mm : 4.00...4.20 Rack travel in mm : 2.00 Speed rpm : 630...690 SET IDLE AUXILIARY SPRING Rack travel in mm : 2.00 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.50 rpm : 747...752 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 150.0...180.0 1000 s: (146.0...184.0) Rack travel in mm : 20.00...21.00 LOW IDLE Speed rpm : 650
Rack travel in mm : 4.00...4.20
Del.quantity cm3/: 17.0...21.0
1000 s: (14.5...23.5)
Spread cm3 : 3.00 1000 s: (6.00) Remarks: Delivery—valve spring pre-tension = 2.40...2.60 mm. Permissible alteration from 2.20...2.90

Note remarks

: MB 14,7 h : 07.02.89 Test sheet Edition Replaces : 26.6.87 : ISO-4113 Test oil

Combination no. : 0 401 878 710

Injection pump

Pump designation : PE8P110A320LS3845 EP type number : 0 411 818 715

Governor

Governor design. : RSV350...750P0A824-1

: 0 421 833 270 Governer no.

Customer-spec. information

Customer : DAIMLER-BENZ

: OM442 Engine

1st version kW : 163.0 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10 : (3.95...4.15) Rack travel in mm : 9.00...12.00 Firing order : 8-7-2-6-3-5-

Phasina : 0-45-90-135-180-225-

Phasing : 270-315

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.90...14.00

Del.quantity cm3/: 14.8...15.0

100 s: (14.5...15.2)

Spread cm3 : 0.4

100 s: (0.8)

2nd speed rpm : 350.0 Rack travel in mm : 7.9...8.2 Del.quantity cm3/: 1.4...1.8

100 s: (1.1...2.0)

Spread cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

Del.quantity : 148.0...150.0

1000 : (145.5...152.5)

Spread : 4.00 cm3

1000 : (8.00)

RATED SPEED

1st version

Control lever

position degrees: 22...30

L01

Testing: 1st rack travel in: 12.90 Speed rpm : 750...755 2nd rack travel in: 4.00 Speed rpm : 780...793 4th rack travel in: 1000

Speed rpm : 0.30...1.40

LOW IDLE 1 Control Lever

position degrees: 10...18 Setting point w/out bumper spring

Speed rpm : 350 Rack travel in mm : 7.1

Testing:

Speed rpm : 100 Minimum rack trave: 19.50 Speed rpm : 350 Rack travel in mm : 7.00...7.20

SET IDLE AUXILIARY SPRING Rack travel in mm : 2.00

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 150.0...170.0 1000 s: (146.0...174.0)

Remarks:

Observe VDT-I-420/120

APPLICATION

Generator

Note remarks

Test sheet : MAN 10.0 a Edition : 07.04.89 Replaces : 5.8.88 Test oil : ISO-4113

Combination no. : 0 402 035 020

Injection pump

Pump designation : PES5P120A720/3LS512

EP type number : 0 412 025 021

Governor

Governor design. : RQ300/1100PA813-1 Governer no. : 0 421 801 405

Customer spec. information Customer : MAN

Engine : D2865LF

1st version kW : 191.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60

: (3.45...3.65)

Rack travel in mm : 9.00...12.00 : 1-3-5-4-2 Firing order

Phasina : 0-72-144-216-288

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 5

BASIC SETTING

1st speed rpm: 750

Rack travel in mm : 10.70...10.80

Del.quantity cm3/: 20.9...21.1

100 s: (20.6...21.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 3.9...4.1 Del.quantity cm3/ : 1.2...1.8

100 s: (0.9...2.1)

Spread cm3 : 0.8100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

Speed rpm : 600 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750 Aneroid pressure h: 1000

Del.quantity : 209.0...211.0 1000 : (206.0...214.0)

cm3 : 5.00 1000 : (9.00) Spread

RATED SPEED

1st version

Setting point:

rpm Rack travel in mm: 20.0

Testina:

1st rack travel in: 9.10

rpm : 1145...1160 Speed 2nd rack travel in: 4.00 rpm : 1180...1210 Speed 4th rack travel in: 1300 Speed rpm : 0.00...1.00 LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Speed Rack travel in mm: 4.0 Testina: Speed rpm : 100 Minimum rack trave: 5.50 Speed rpm : 300 Rack travel in mm : 3.90...4.10 Rack travel in mm : 2.00 Speed : 320...380 rom TORQUE CONTROL Dimension a mm : 0.30 Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 10.20...10.30 2nd speed rpm : 750 Rack travel in m: 11.00...11.20 3rd speed rpm : 920 Rack travel in m: 10.60...10.80 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rom hPa : 1000 Pressure Rack travel mm : 10.70...10.80 Measurement 1/min: 500 Speed 1st pressure hPa : - Rack travel in m: 7.70...7.90 2nd pressure hPa : 125 Rack travel in m: 8.10...8.20 3rd pressure hPa : 430 Rack travel in m: 10.20...10.50 START CUT-OUT Speed 1/min : 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 Speed rpm : 1100

Del.quantity cm3/: 198.0...202.0 1000 s: (195.0...205.0) Aneroid pressure h: 1000 Speed rpm: 650 Del.quantity cm3/: 200.0...206.0 1000 s: (197.0...209.0) Aneroid pressure h: -Speed rpm: 500 Del.quantity cm3/: 125.0...127.0 1000 s: (122.0...130.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 9.10 Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 190.0...210.0 1000 s: (186.0...214.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 3.90...4.10
Del.quantity cm3/ : 12.0...18.0
1000 s: (9.0...21.0)
Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

: MAN-NR. 2-7881

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MAN 10.0 b Edition : 07.04.89 Replaces : 5.8.88 Test oil : ISO-4113 Combination no. : 0 402 035 021 Injection pump Pump designation : PES5P120A720/3LS512 EP type number : 0 412 025 021 Governor Governor design. : RQV300...1100PA876 : 0 421 813 661 Governer no. Customer-spec. information Customer : MAN

Engine : D2865LF

1st version kW : 191.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60 : (3.45...3.65) Rack travel in mm : 9.00...12.00

: 1-3-5-4-2 Firing order

Phasina : 0-72-144-216-288

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 5

BASIC SETTING

1st speed rom: 750

Rack travel in mm : 10.70...10.80

Del.quantity cm3/: 20.9...21.1

100 s: (20.6...21.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 3.9...4.1 Del.quantity cm3/ : 1.2...1.8 100 s: (0.9...2.1)

cm3 : 0.8 100 s: (1.2) Spread

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300 travel mm : 1.70...2.00

: 850 2nd speed rom

: 6.00...6.20 travel mm rpm : 1100 3rd speed

: 8.10...8.30 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1130 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750 Aneroid pressure h: 1000

: 209.0...211.0 Del.quantity 1000 : (206.0...214.0)

: 5.00 Spread cm3

: (9.00) 1000

RATED SPEED

1st version Control Lever

position degrees: 47...55

Testing:

1st rack travel in: 9.20

Speed rpm: 1140...1150 2nd rack travel in: 4.00

Speed rpm : 1215...1245

4th rack travel in: 1350

Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever

position degrees: 16...24

Testina:

Speed rest : 100 Minimum rack trave: 5.50 rpm : 300

Rack travel in mm : 3.90...4.10

CONSTANT REGULATION

rpm : 310...410 Speed

TORQUE CONTROL

Dimension a mm : 0.50

Torque control curve - 1st version 1st speed rpm : 750

Rack travel in m: 10.70...10.80

2nd speed rpm : 1100

Rack travel in m: 10.20...10.30

3rd speed rpm : 900

Rack travel in m: 10.60...10.70

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed : 500 rpm hPa : 1000 Pressure

Rack travel mm : 10.70...10.80

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 7.70...7.90

2nd pressure hPa : 125

Rack travel in m: 8.10...8.20

3rd pressure hPa : 430

Rack travel in m: 10.20...10.50

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

Speed rpm : 1100 Del.quantity cm3/ : 199.0...201.0 1000 s: (196.0...204.0)

Aneroid pressure h: 1000

Speed rpm : 650

Del.quantity cm3/: 200.0...206.0 1000 s: (197.0...209.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 125.0...127.0 1000 s: (122.0...130.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.20

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 190.0...210.0

1000 s: (186.0...214.0)

LOW IDLE

Speed rpm : 300 Rack travel in mm : 3.90...4.10 Del.quantity cm3/ : 12.0...18.0

1000 s: (9.0...21.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

: MAN-NR. 2-7882

Note remarks

: MAN 11,9a13 : 31.07.87 Test sheet Edition : 12.9.86 Replaces Test oil : ISO-4113

Combination no. : 0 402 036 044

Injection pump

Pump designation: PES6P12DA72D/3LS47D-

EP type number : 0 412 026 050

Governor

Governor design. : RQ300/1100PA658-19 Governer no. : 0 421 801 323

Customer-spec. information Customer : MAN

Engine : D2866LFZ/330

1st version kW : 243.0 : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

**Openina** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

L07

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 6

BASIC SETTING

rpm: 750 1st speed

Rack travel in mm : 11.30...11.40

Del.quantity cm3/: 20.7...20.9

100 s: (20.4...21.2)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm : 4.6...4.8

Del.quantity cm3/: 1.2...1.8

100 s: (0.9...2.1)

Spread cm3 : 0.8100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2 rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750 Aneroid pressure h: 1000

Del.quantity : 207.0...209.0 1000

: (204.0...212.0) : 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm Rack travel in mm: 20.0

Testing:

1st rack travel in: 9.50 Aneroid pressure h: 1000 Speed rpm: 1145...1160 2nd rack travel in: 4.00 Speed rpm : 1100 Del.quantity cm3/ : 203.0...207.0 Speed rpm : 1185...1215 1000 s: (200.0...210.0) 4th rack travel in: 1300 Aneroid pressure h: 1000 rpm : 0.00...1.00 Speed Speed : 650 rpm Del.quantity cm3/: 208.0...214.0 1000 s: (205.0...217.0) LOW IDLE 1 Setting point w/out bumper spring Aneroid pressure h: 280 Speed rpm : 300 Rack travel in mm : 4.7 Speed rpm : 500 Del.quantity cm3/ : 184.0...196.0 1000 s: (181.0...199.0) Testing: Aneroid pressure h: -Speed rpm : 100 Minimum rack trave: 6.20 Speed rpm : 500 Speed Del.quantity cm3/: 132.0...134.0 1000 s: (129.0...137.0) rpm : 300 Rack travel in mm : 4.60...4.80 Rack travel in mm : 2.00 Speed : 340...380 rom BREAKAWAY TORQUE CONTROL 1st version Dimension a mm : 0.50 1mm rack travel less than Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 11.70...11.80 full load rack tr: 9.50 rpm : 1145...1160 Speed 2nd speed rpm : 750 Rack travel in m: 11.90...12.20 STARTING FUEL DELIVERY 3rd speed rpm : 875 Rack travel in m: 11.80...12.00 Speed rpm : 100 Del.quantity cm3/ : 225.0...245.0 1000 s: (221.0...249.0) 4th speed rpm : 950 Rack travel in m: 11.20...11.50 Aneroid/Altitude Compensator Test LOW IDLE Speed rpm : 300 1st version Rack travel in mm : 4.60...4.80 Setting Del.quantity cm3/: 12.0...18.0 Speed rpm : 500 1000 s: (9.0...21.0) Pressure hPa : 1000 cm3 : 8.00 Spread Rack travel mm : 11.30...11.40 1000 s: (12.00) Measurement Remarks: 1/min: 500 Speed : MAN-NR. 2-7712 1st pressure hPa : -Rack travel in m: 8.90...9.10 2nd pressure hPa : 85 Rack travel in m: 9.30...9.40 3rd pressure hPa : 280 Rack travel in m: 10.50...10.90 START CUT-OUT Speed 1/min: 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version

L08

### BOSCH INJ. PUMP TEST SPECIFICATIONS

#### Note remarks

Test sheet : MAN 11,9a22 Edition : 11.12.87 Replaces : 18.8.87 Test oil : ISO-4113

Combination no. : 0 402 036 061

Injection pump

Pump designation: PES6P120A720/3LS470-

EP type number : 0 412 026 050

Governor

Governor design. : RQV300...1100PA700-2

Governer no. : 0 421 813 543

Customer-spec. information Customer : MAN

: D2866LF/290 Engine

1st version kW : 213.0 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Openina .

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 9.00...12.00

: 6-2-4-1-5-3 Firing order

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 6

#### BASIC SETTING

rpm: 750 1st speed

Rack travel in mm: 10.30...10.40

Del.quantity cm3/: 18.3...18.5

100 s: (18.0...18.8)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 300.0 2nd speed Rack travel in mm: 4.8...5.0 Del.quantity cm3/: 1.2...1.8

100 s: (0.9...2.1)

Spread cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300 travel mm : 1.50...1.70

rpm : 850 2nd speed : 5.70...6.00 rpm : 1100 travel mm

3rd speed : 8.00...8.20 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1130 Speed Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750 Aneroid pressure h: 1000

Del.quantity : 183.0...188.0)

Spread cm3 : 5.00 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 62...70 Testing: 1st rack travel in: 8.70 Speed rpm: 1140...1150 2nd rack travel in: 4.00 Speed rpm : 1205...1235 4th rack travel in: 1350 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 7...15 Testing: Speed : 100 rpm Minimum rack trave: 6.40 rpm : 300 Rack travel in mm : 4.80...5.00 Rack travel in mm: 2.00 Speed : 375...435 rom TORQUE CONTROL Dimension a mm : 0.65 Torque control curve - 1st version rpm : 750 1st speed Rack travel in m: 10.30...10.40 2nd speed rpm : 1100 Rack travel in m: 9.70...9.80 3rd speed rpm : 850 Rack travel in m: 10.20...10.30 4th speed rpm : 925 Rack travel in m: 9.90...10.10 Compensator Test

Aneroid/Altitude

1st version Setting Speed : 500 rpm Pressure hPa : 1000 Rack travel mm : 10.30...10.40 Measurement

Speed 1/min: 500 1st pressure hPa : -Rack travel in m: 8.90...9.10 2nd pressure hPa : 85 Rack travel in m: 9.30...9.40 3rd pressure hPa : 160 Rack travel in m: 9.80...10.20 START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1000

Speed rpm : 1100 Del.quantity cm3/ : 173.0...177.0 1000 s: (170.0...180.0)

Aneroid pressure h: 1000 Speed rpm : 650

Del.quantity cm3/: 174.0...180.0 1000 s: (171.0...183.0)

Aneroid pressure h: 160 : 500 Speed rpm

Del.quantity cm3/: 157.0...169.0 1000 s: (154.0...172.0)

Aneroid pressure h: rpm : 500 Speed

Del.quantity cm3/: 132.0...134.0 1000 s: (129.0...137.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 8.70

Speed rpm : 1140...1150

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 225.0...245.0 1000 s: (221.0...249.0)

LOW IDLE

Speed rpm : 300

Rack travel in mm : 4.80...5.00 Del.quantity cm3/: 12.0...18.0 1000 s: (9.0...21.0)

cm3 : 8.00

Spread 1000 s: (12.00)

Remarks:

: MAN-NR. 2-7761

BOSCH INJ. PUMP TEST SPECIFICATIONS Rack travel in mm : 9.00...12.00 : 6-2-4-1-5-3 Firing order Note remarks : MAN 11,9 g6 Test sheet Edition : 30.09.88 Phasing : 0-60-120-180-240-300 : 11.12.87 Replaces Test oil : ISO-4113 Tolerance + - ° : 0.50 (0.75) Combination no. : 0 402 036 064 Time to cyl. no. : 6 Injection bump BASIC SETTING Pump designation: PES6P110A720/3LS477rpm: 800 1st speed : 0 412 016 071 EP type number Governor Rack travel in mm : 10.50...10.60 Governor design. : RQ250/1100PA817-1 Governer no. : 0 421 801 362 Del.quantity cm3/: 9.1...9.4 Customer-spec. information 100 s: (8.8...9.6) Customer : MAN Spread cm3 : 0.4Engine : D2566UH/205 100 s: (0.7) 1st version kW : 150.0 : 2200 Rated speed rpm : 250.0 2nd speed Rack travel in mm : 6.1...6.3 TEST BENCH REQUIREMENTS Del.quantity cm3/: 1.5...2.0 100 s: (1.2...2.2) cm3 : 0.4 100 s: (0.7) Test oil Spread inlet temp. °C : 38...42 Overflow valve GUIDE SLEEVE POSITION : 1 417 413 025 Control-lever position Degree: -2 Inlet press., bar: 1.50 Speed rpm : 600 Rack travel in mm : 19.20...20.80 Test nozzle holder : 0 681 343 009 assembly FULL LOAD DELIV. AT FULL LOAD STOP **Opening** 1st version : 172...175 pressure, bar Speed : 800 rpm : 91.0...94.0 Del.quantity 1000 : (88.5...96.5) Test lines : 1 680 750 015 Spread : 4.00 cm3 1000 : (7.50) Outside diameter x Wall thickness RATED SPEED x Length mm : 6.00X1.50X600 1st version (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. Setting point: : 600 Speed rpm<sup>-</sup> per values

Rack travel in mm : 20.0

Testing:

1st rack travel in: 9.50

Speed rpm : 1145...1160 2nd rack travel in: 4.00 rpm : 1215...1245 Speed

BEGINNING OF DELIVERY

Prestroke mm

Test pressure, bar: 25...27

: 3.50...3.60

: (3.45...3.65)

4th rack travel in: 1300

Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm : 6.2

Testing:

Speed rpm : 100 Minimum rack trave: 7.70 rpm : 250 Speed

Rack travel in mm: 6.10...6.30 Rack travel in mm: 2.00 Speed rpm: 330...370

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 10.50...10.60 2nd speed rpm : 500 Rack travel in m: 10.50...10.70

START CUT-OUT

Speed 1/min: 170 (190)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1100

Del.quantity cm3/: 101.0...109.0

1000 s: (98.0...112.0)

Speed rpm : 500 Del.quantity cm3/ : 77.0...85.0 1000 s: (74.0...88.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 9,50

Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 110.0...130.0 1000 s: (106.0...134.0)

LOW IDLE

Speed rpm : 250 Rack travel in mm : 6.10...6.30

Del.quantity cm3/: 15.0...20.0

1000 s: (12.5...22.5) cm3 : 4.50 Spread

1000 s: (7.50)

Remarks:

: MAN-NR. 2-7768

APPLICATION

**Omnibus** 

BOSCH INJ. PUMP TEST SPECIFICATIONS : 2.80...2.90 Prestroke mm Note remarks : (2.75...2.95) Rack travel in mm : 9.00...12.00 Firing order : 6-2-4-1-5-3 : MAN 11,9a28 : 30.09.88 Test sheet Edition Replaces : 11.12.87 Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 402 036 069 Tolerance + - 0 : 0.50 (0.75) Injection pump Pump designation : PES6P120A720/3LS470-Time to cyl. no. : 6 EP type number : 0 412 026 051 BASIC SETTING Governor Governor design. : RQ300/1100PA679-2 rpm: 750 1st speed Governer no. : 0 421 801 402 Rack travel in mm : 10.60...10.70 Customer-spec. information Customer : MAN Del.quantity cm3/: 18.3...18.5 Engine : D2866LUL 100 s: (18.0...18.8) 1st version kW : 213.0 Spread cm3 : 0.5Rated speed : 2200 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 300.0 2nd speed Rack travel in mm: 5.0...5.2 Test oil inlet temp. °C Del.quantity cm3/: 1.2...1.8 : 38...42 100 s: (0.9...2.1) Overflow valve Spread cm3 : 0.8: 1 417 413 025 100 s: (1.2) Inlet press., bar: 1.50 GUIDE SLEEVE POSITION Control-lever position Test nozzle holder Degree: -2 assembly : 1 688 901 019 rpm : 600 Speed Rack travel in mm : 19.20...20.80 Openina pressure, bar : 207...210 FULL LOAD DELIV. AT FULL LOAD STOP Orifice plate 1st version diameter mm : 0,8 Speed rpm : 750 Aneroid pressure h: 1000 Del.quantity : 183.0...185.0 Test Lines 1000 : (180.0...188.0) : 1 680 750 067 Spread cm3 : 5.00 Outside diameter 1000 : (9.00) x Wall thickness x Length mm : 6.00x1.50x1000 RATED SPEED (A) Injection pump setting values 1st version Insp. values in parentheses Set equal delivery quant. Setting point: Speed : 600 rpm

Rack travel in mm: 20.0

Testina:

per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

1st rack travel in: 9.60 rpm : 1145...1160 Speed 2nd rack travel in: 4.00 rpm : 1180...1210 Speed 4th rack travel in: 1350 Speed rpm : 0.00...1.00 LOW IDLE 1 Setting point wout bumper spring Speed rpm : 300 Rack travel in mm : 5.1 Testing: Speed rpm : 100 Minimum rack trave: 6.60 Speed rpm: 300
Rack travel in mm: 5.00...5.20
Rack travel in mm: 2.00
Speed rpm: 345...385 TORQUE CONTROL Dimension a mm : 0.20 Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 10.60...10.70 2nd speed rpm : 750 Rack travel in m: 11.20...11.40 3rd speed rpm : 925 Rack travel in m: 10.70...11.00 Aneroid/Altitude Compensator Test 1st version Setting rpm : 500 Speed Remarks: Pressure hPa : 1000 Rack travel mm : 10.60...10.70 Measurement Speed 1/min : 500 1st pressure hPa : -Rack travel in m: 8.80...9.00 2nd pressure hPa : 210 Rack travel in m: 9.10...9.20 3rd pressure hPa : 375 Rack travel in m: 9.90...10.20 START CUT-OUT Speed 1/min: 190 (210) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 Speed rpm : 1100

Del.quantity cm3/: 190.0...196.0 1000 s: (187.0...199.0) Aneroid pressure h: 1000 Speed rpm : 650 Del.quantity cm3/: 174.0...180.0 1000 s: (171.0...183.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 119.0...121.0 1000 s: (116.0...124.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 9.60 Speed rpm : 1145...1160 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 225.0...245.0 1000 s: (221.0...249.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 5.00...5.20
Del.quantity cm3/: 12.0...18.0
1000 s: (9.0...21.0) cm3 : 8.00Spread 1000 s: (12.00)

: MAN-NR. 2-7878

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BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 2.80...2.90 : (2.75...2.95)
Rack travel in mm : 9.00...12.00 Note remarks Test sheet : MAN 11,9a30 : 6-2-4-1-5-3 Firing order : 11.11.88 : 6.11.87 Edition Replaces Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 402 036 071 Tolerance + - ° : 0.50 (0.75) Injection pump Pump designation : PES6P120A720/3LS470-Time to cyl. no. : 6 EP type number : 0 412 026 050 BASIC SETTING Governor Governor design. : RQ300/1100PA813-3 1st speed rpm: 750 Governer no. : 0 421 801 422 Rack travel in mm : 10.60...10.70 Customer—spec. information Customer Del.quantity cm3/: 19.1...19.3 Engine : D2866TOH 100 s: (18.8...19.6) 1st version kW : 213.0 Spread cm3 : 0.5Rated speed : 2200 100 s: (0.9) TEST BENCH REQUIREMENTS 2nd speed rpm : 300.0 Rack travel in mm : 4.7...4.9 Test oil inlet temp. °C : 38...42 Del.quantity cm3/: 1.2...1.8 100 s: (0.9...2.1) Overflow valve Spread cm $\leq$  : 0.8 : 1 417 413 025 100 3: (1.2) Inlet press., bar: 1.50 GUIDE SLEEVE POSITION Control-lever position Test nozzle holder Degree: -2 : 1 688 901 019 rpm : 750 assembly Rack travel in mm : 14.70...16.30 Opening pressure, bar : 207...210 FULL LOAD DELIV. AT FULL LOAD STOP Orifice plate 1st version diameter mm : 0,8 Speed rpm : 750 Aneroid pressure h: 1000 Aneroiu Del.quantity 1000 : 191.0...193.0 Test lines : 1 680 750 067 : (188.0...196.0) : 5.00 Spread cm3 1000 : (9.00) x Wall thickness

Outside diameter

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 30...32

Setting point: Speed rpm Rack travel in mm: 15.5

Testing:

RATED SPEED

1st version

1st rack travel in: 9.30 Aneroid pressure h: 1000 rpm : 1145...1160 Speed Speed rpm : 1100 2nd rack travel in: 4.00 Del.quantity cm3/: 193.0...197.0 rpm : 1180...1210 1000 s: (190.0...200.0) Speed 4th rack travel in: 1300 Aneroid pressure h: 1000 Speed rpm : 0.00...1.00Speed man : 650 Del.quantity cm3/: 184.0...190.0 1000 s: (181.0...193.0) LOW IDLE 1 Setting point w/out bumper spring Aneroid pressure h: 20 rpm : 300 Speed rpm : 500 Del.quantity cm3/ : 168.0...180.0 1000 s: (165.0...183.0) 500 Rack travel in mm: 4.8 Testing: Aneroid pressure h: -Speed rpm : 500 rpm : 100 Speed Del.quantity cm3/: 119.0...121.0 1000 s: (116.0...124.0) Minimum rack trave: 6.30 rpm : 300 Rack travel in mm : 4.70...4.90 Rack travel in mm : 2.00 Speed BREAKAWAY TORQUE CONTROL 1st version Dimension a mm : 0.30 1mm rack travel less than Torque control curve - 1st version 1st speed rpm : 1100 full load rack tr: 9.30 Rack travel in m: 10.30...10.40 Speed rpm : 1145...1160 rpm : 750 2nd speed Rack travel in m: 11.00...11.20 STARTING FUEL DELIVERY 3rd speed rpm : 980 Rack travel in m: 10.90...11.10 4th speed rpm : 1030 Rack travel in m: 10.40...10.70 Speed rpm : 100 Del.quantity cm3/: 225.0...245.0 1000 s: (221.0...249.0) Aneroid/Altitude Compensator Test LOW IDLE Speed rpm : 300 Rack travel in mm : 4.70...4.90 1st version Setting Del.quantity cm3/: 12.0...18.0 1000 s: (9.0...21.0) rom : 500 hPa : 1000 Speed man Pressure Spread cm3 : 8.00Rack travel mm : 10.60...10.70 1000 s: (12.00) Measurement Remarks: Speed 1/min : 500 1st pressure hPa : -APPLICATION Rack travel in m: 8.50...8.70 2nd pressure hPa : 240
Rack travel in m: 8.90...9.00
3rd pressure hPa : 520
Rack travel in m: 9.90...10.30 **Omnibus** START CUT-OUT Speed 1/min : 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version L16

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,9a31 Edition : 10.02.89 : 30.9.88 Replaces Test oil : ISO-4113

Combination no. : 0 402 036 073

Injection pump

Pump designation : PES6P120A720/3LS470-

EP type number : 0 412 026 050

Governor

Governor design. : RQ300/1100PA813-4 Governer no. : 0 421 801 425

Customer-spec. information

Customer : MAN

Engine : D2866KUH

: 265.0 1st version kW Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 30...32 Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 6-2-4-1-5-3

Phasina : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

rpm: 750 1st speed

Rack travel in mm : 12.50...12.60

Del.quantity cm3/: 23.8...24.0

100 s: (23.5...24.3)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm: 4.9...5.1 Del.quantity cm3/: 1.2...1.8

100 s: (0.9...2.1)

Spread cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2 rpm : 750 Speed

Rack travel in mm : 14.70...16.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750 Aneroid pressure h: 1000

: 238.0...240.0 Del.quantity 1000 : (235.0...243.0)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm Rack travel in mm: 15.5

Testina:

1st rack travel in: 10.50 Aneroid pressure h: 1000 Speed rpm : 1145...1160 Speed rpm : 1100 Del.quantity cm3/: 218.0...222.0 2nd rack travel in: 4.00 1000 s: (215.0...225.0) Aneroid pressure h: 1000 rpm : 1185...1215 Speed 4th rack travel in: 1300 rom : 0.00...1.00 Speed Speed rpm : 650 Del.quantity cm3/ : 238.0...244.0 1000 s: (235.0...247.0) LOW IDLE 1 Setting point w/out bumper spring Aneroid pressure h: 20 rpm : 300 : 500 Speed rpm Rack travel in mm: 5.0 Del.quantity cm3/: 191.0...197.0 1000 s: (188.0...200.0) Testing: Aneroid pressure h: -Speed Speed rpm : 500 Del.quantity cm3/ : 119.0...121.0 rpm : 100 Minimum rack trave: 6.50 Speed : 300 rpm 1000 s: (116.0...124.0) Rack travel in mm : 4.90...5.10 Rack travel in mm: 2.00 : 400...440 Speed nom **BREAKAWAY** TORQUE CONTROL 1st version Dimension a mm : 0.35 1mm rack travel less than Torque control curve - 1st version rpm : 1100 1st speed full load rack tr: 10.50 Rack travel in m: 11.50...11.60 Speed rpm : 1145...1160 2nd speed rpm : 750 Rack travel in m: 12.70...12.90 STARTING FUEL DELIVERY 3rd speed : 880 rpm Rack travel in m: 12.30...12.50 4th speed rpm : 925 Speed rpm : 100 Del.quantity cm3/ : 225.0...245.0 Rack travel in m: 11.70...12.00 1000 s: (221.0...249.0) Aneroid/Altitude Compensator Test LOW IDLE : 300 Speed rpm 1st version Rack travel in mm : 4.90...5.10 Setting Del.quantity cm3/: 12.0...18.0 Speed 1000 s: (9.0...21.0) rpm : 500 hPa : 1000 Pressure Spread cm3 : 8.00Rack travel mm : 12.50...12.60 1000 s: (12.00) Measurement Remarks: Speed 1/min : 500 : MAN-NR. 2-7904 1st pressure hPa : -APPLICATION Rack travel in m: 8.50...8.70 2nd pressure hPa : 190 **Omnibus** Rack travel in m: 8.90...9.00 3rd pressure hPa : 520 Rack travel in m: 11.10...11.40 START CUT-OUT Speed 1/min: 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version

L18

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,9a33 Edition : 30.09.88 Replaces : 6.4.88

Test oil : ISO-4113

Combination no. : 0 402 036 074

Injection pump

Pump designation: PES6P120A720/3LS470-

EP type number : 0 412 026 050

Governor

Governor design. : RQ300/1100PA658-24

Governer no. : 0 421 801 437

Customer-spec. information Customer : MAN

Engine : D2866K0H

1st version kW : 265.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.80...2.90 Prestroke mm : (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 6-2-4-1-5-3

Phasina : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

rpm : 7501st speed

Rack travel in mm : 12.20...12.30

Del.guantity cm3/: 22.8...23.0

100 s: (22.5...23.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm: 4.7...4.9 Del.quantity cm3/: 1.2...1.8

100 s: (0.9...2.1)

cm3 : 0.8Spread 100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600 Speed Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Aneroid pressure h: 1000

Del.quantity : 220.0...233.0)

: 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

: 600 Rack travel in mm: 20.0

Testing:

1st rack travel in: 10.20 Speed rpm : 1145...1160 2nd rack travel in: 4.00 rom : 1185...1215 Speed 4th rack travel in: 1300 rpm : 0.00...1.00 Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 4.8 Testing: rpm : 100 Speed Minimum rack trave: 6.30 : 300 Speed nom Rack travel in mm : 4.70...4.90 Rack travel in mm: 2.00 : 345...385 Speed rom TORQUE CONTROL Dimension a mm : 0.55 Torque control curve - 1st version rpm : 1100 1st speed Rack travel in m: 11.20...11.30 : 750 2nd speed rom Rack travel in m: 12.70...12.90 3rd speed rpm : 920 Rack travel in m: 12.40...12.60 4th speed rpm: 985 Rack travel in m: 11.60...11.90 Aneroid/Altitude Compensator Test 1st version Settina Speed rpm : 500 Pressure hPa : 1000 Rack travel mm : 12.20...12.30 Measurement Speed 1/min: 500 1st pressure hPa : -Rack travel in m: 9.10...9.30 2nd pressure hPa : 80 Rack travel in m: 9.40...9.50 3rd pressure hPa : 400 Rack travel in m: 11.00...11.40 START CUT-OUT Speed 1/min : 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version

Aneroid pressure h: 1000 : 1100 Speed rpm Del.quantity cm3/: 210.0...214.0 1000 s: (207.0...217.0) Aneroid pressure h: 1000 Speed rpm : 650 Del.quantity cm3/: 228.0...234.0 1000 s: (225.0...237.0) : 500 Speed rpm Del.quantity cm3/: 188.0...200.0 1000 s: (185.0...203.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 134.0...136.0 1000 s: (131.0...139.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 10.20 Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 225.0...245.0 1000 s: (221.0...249.0)

LOW IDLE

Speed rpm : 300 Rack travel in mm : 4.70...4.90 Del.quantity cm3/ : 12.0...18.0 1000 s: (9.0...21.0)

Spread cm3 : 8.00 1000 s: (12.00)

Remarks:

: MAN-NR. 2-7910

APPLICATION

Omnibus

L20

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,9a35 Edition : 07.04.89 Replaces : 11.7.88

Test oil : TSO-4113

Combination no. : 0 402 036 076

Injection pump

Pump designation : PES6P120A720/3LS470-

EP type number : 0 412 026 055

Governor

Governor design. : RQV300...1100PA700-5

: D 421 813 713 Governer no.

Customer-spec. information Customer

Engine : D2866LFG

1st version kW : 243.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening.

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.80...2.90 : (2.75...2.95) Prestroke mm

Rack travel in mm : 9.00...12.00

Firing order : 6-2-4-1-5-3

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 750

Rack travel in mm : 11.30...11.40

Del.quantity cm3/: 20.2...20.4

100 s: (19.9...20.7)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 300.0 2nd speed Rack travel in mm: 4.8...5.0

Del.quantity cm3/: 1.2...1.8 100 s: (0.9...2.1)

cm3 : 0.8Spread

100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

: 1.50...1.90 travel mm : 450 2nd speed rpm

travel mm : 2.90...3.50

: 850 3rd speed rpm

travel mm : 5.50...5.90

: 1100 4th speed rpm

travel mm : 7.40...7.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1175

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Aneroid pressure h: 1000

Del.quantity : 202.0...207.0) Rack travel in m: 9.30...9.40 3rd pressure hPa : 310 : 5.00 Spread cm3 Rack travel in m: 10.80...11.20 1000 : (9.00) START CUT-OUT RATED SPEED Speed 1/min : 220 (240) 1st version Control lever FUEL DELIVERY CHARACTERISTICS position degrees: 48...56 Testing: 1st version 1st rack travel in: 9.80 Aneroid pressure h: 1000 rpm : 1140...1150 Speed rpm : 1100 Del.quantity cm3/ : 203.0...207.0 Speed 2nd rack travel in: 4.00 Speed rpm : 1225...1255 4th rack travel in: 1350 1000 s: (200.0...210.0) Aneroid pressure h: 1000 Speed rpm : 0.00...1.00LOW IDLE 1 Control Lever : 500 position degrees: 14...22 Speed rpm Del.quantity cm3/: 184.0...196.0 Testing: 1000 s: (181.0...199.0) Speed : 100 חמרו Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 132.0...134.0 1000 s: (129.0...137.0) Minimum rack trave: 6.40 : 300 rpm Rack travel in mm : 4.80...5.00 CONSTANT REGULATION rpm : 310...410 Speed **BREAKAWAY** TORQUE CONTROL 1st version Dimension a mm : 0.80 1mm rack travel less than Torque control curve - 1st version 1st speed rpm : 750 full load rack tr: 9.80 Rack travel in m: 11.60...11.70 Speed rpm : 1140...1150 rpm : 1100 2nd speed Rack travel in m: 10.80...10.90 STARTING FUEL DELIVERY rpm : 865 3rd speed Rack travel in m: 11.30...11.40 rpm : 985 Speed rpm : 100 Del.quantity cm3/ : 225.0...245.0 1000 s: (221.0...249.0) 4th speed Rack travel in m: 10.90...11.20 Aneroid/Altitude Compensator Test LOW IDLE rpm : 300 Speed 1st version Rack travel in mm : 4.80...5.00 Del.quantity cm3/: 12.0...18.0 Setting Speed : 500 1000 s: (9.0...21.0) man hPa : 1000 Pressure Spread cm3 : 8.00 Rack travel mm : 11.30...11.40 1000 s: (12.00) Measurement Remarks: 1/min: 500 Speed : MAN-NR. 2-7911

L22

1st pressure hPa : -

2nd pressure hPa : 85

Rack travel in m: 9.00...9.20

BOSCH INJ. PUMP TEST SPECIFICATIONS : 2.80...2.90 Prestroke mm Note remarks : (2.75...2.95) Rack travel in mm : 9.00...12.00 Test sheet : MAN 11,9a37 Firing order : 6-2-4-1-5-3 Edition : 10.02.89 Replaces Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 402 036 077 Tolerance + - 0 : 0.50 (0.75) Injection pump Pump designation : PES6P120A720/3LS470-Time to cyl. no. : 6 EP type number : 0 412 026 050 BASIC SETTING Governor Governor design. : RQ300/1100PA813-6 1st speed rpm: 750 Governer no. : 0 421 801 466 Rack travel in mm : 11.40...11.50 Customer-spec. information Customer Del.quantity cm3/: 20.0...20.2 Engine : D2866TUH/001 100 s: (19.7...20.5) 1st version kW : 213.0 Spread cm3 : 0.5: 2200 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS 2nd speed rpm : 300.0 Rack travel in mm : 5.2...5.4 Del.quantity cm3/ : 1.2...1.8 100 s: (0.9...2.1) Test oil inlet temp. °C : 38...42 Overflow valve Spread cm3 : 0.8 : 1 417 413 025 100 s: (1.2) Inlet press., bar: 1.50 GUIDE SLEEVE POSITION Control-lever position Test nozzle holder Degree: -2 rpm : 750 : 1 688 901 019 assembly Rack travel in mm : 14.70...16.30 Opening | : 207...210 pressure, bar FULL LOAD DELIV. AT FULL LOAD STOP Orifice plate 1st version diameter mm : 0,8 Speed rpm : 750 Aneroid pressure h: 1000 Del.quantity : 200.0...202.0 1000 Test lines : 1 680 750 067 : (197.0...205.0) : 5.00 Spread cm3 Outside diameter 1000 : (9.00)

RATED SPEED

1st version

Testing:

Setting point:

Speed rpm : 750 Rack travel in mm : 15.5

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

L23

1st rack travel in: 10.40 rpm : 1145...1160 Speed 2nd rack travel in: 4.00 Speed rpm : 1170...1200 4th rack travel in: 1300 Speed rpm : 0.00...1.00 LOW IDLE 1 Setting point w/out bumper spring Speed rpm: 300 Rack travel in mm : 5.3 Testina: Speed rpm : 100 Minimum rack trave: 6.80 Speed rpm : 300 Rack travel in mm: 5.20...5.40 Rack travel in mm : 2.00 rpm : 390...430 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 11.40...11.50 rpm : 750 2nd speed Rack travel in m: 11.40...11.60 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rpm Pressure hPa : 1000 Rack travel mm : 11.40...11.50 Measurement Speed  $1/\min : 500$ 1st pressure hPa : -Rack travel in m: 8.50...8.70 2nd pressure hPa : 190 Rack travel in m: 8.80...8.90 3rd pressure hPa : 350 Rack travel in m: 9.80...10.20 START CUT-OUT Speed 1/min : 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version

Aneroid pressure h: -Speed 500 rpm : Del.quantity cm3/: 119.0...121.0 1000 s: (116.0...124.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.40 rpm : 1145...1160 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 215.0...235.0 1000 s: (211.0...239.0) LOW IDLE Speed rpm : 300 Rack travel in mm : 5.20...5.40 Del.quantity cm3/ : 12.0...18.0 1000 s: (9.0...21.0) Spread cm3 : 8.00 1000 s: (12.00) Remarks: : MAN-NR. 2-7893 APPLICATION **Omnibus** 

Speed

Aneroid pressure h: 1000

rpm : 1100 Del.quantity cm3/: 208.0...214.0 1000 s: (205.0...217.0) BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet

Edition

: MAN 11,9 j2 : 31.03.89

Replaces

Test oil

: ISO-4113

Combination no. : 0 402 036 729

Injection pump

Pump designation : PES6P120A720LS3205

EP type number

: 0 412 026 729

Governor

Governor design.

: RQ300/1100PA813-7

Governer no.

: 0 421 801 474

Customer-spec. information Customer

: MAN

Engine

: D2866LUH

1st version kW

: 273.0

Rated speed

: 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines

: 1 680 750 067

Outside diameter

x Wall thickness

x Length mm

: 6.00x1.50x1000

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 3.70...3.80

: (3.65...3.85)
Rack travel in mm : 9.00...12.00

Firing order

: 6-2-4-1-5-3

Phasing

: 0-60-120-180-240-300

Tolerance + - 0

: 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed

rpm: 700

Rack travel in mm : 12.80...12.90

Del.quantity cm3/: 23.6...23.8

100 s: (23.3...24.1)

Spread

2nd speed

cm3 : 0.5

100 s: (0.9)

rpm : 300.0

Rack travel in mm : 4.1...4.3 Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 650

Rack travel in mm : 14.70...16.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700 Aneroid pressure h: 1200

Del.quantity

: 236.0...238.0

1000 : (233.0...241.0)

: 5.00 cm3 Spread

1000 : (9.00)

RATED SPEED

1st version

Setting point:

rpm

: 650

Rack travel in mm : 15.5

Testing:

1st rack travel in: 11.80

rom : 1145...1160 Speed 2nd rack travel in: 4.00 : 1190...1220 Speed rpm 4th rack travel in: 1350 Speed rpm : 0.00...1.00LOW IDLE 1 Setting point w/out bumper spring rpm Rack travel in mm: 4.2 Testing: Speed rpm Minimum rack trave: 5.70 rpm : 300 Speed Rack travel in mm : 4.10...4.30 Rack travel in mm : 2.00 Speed rpm : 380...420 TORQUE CONTROL Dimension a mm : 0.20 Torque control curve - 1st version 1st speed rpm : 700 Rack travel in m: 14.20...14.40 : 1100 2nd speed rpm Rack travel in m: 13.00...13.10 3rd speed rpm : 885 Rack travel in m: 13.80...14.00 4th speed : 935 rpm Rack travel in m: 13.20...13.50 Aneroid/Altitude Compensator Test 1st version Settina Speed : 500 rpm Pressure hPa : 1200 Rack travel mm : 12.80...12.90 Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 8.50...8.70 2nd pressure hPa : 190 Rack travel in m: 8.90...9.00 3rd pressure hPa : 520 Rack travel in m: 11.10...11.40 START CUT-OUT Speed 1/min : 220 (240) FUEL DELIVERY CHARACTERISTICS

Speed rpm : 1100 Del.quantity cm3/ : 226.0...232.0 1000 s: (223.0...235.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 120.0...122.0 1000 s: (117.0...125.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.80 Speed rpm : 1145...1160 INTERMEDIATE RATED SPEED Rack travel in mm: 4.00 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 200.0...220.0 1000 s: (196.0...224.0) LOW IDLE Speed rpm : 300 Rack travel in mm : 4.10...4.30 Del.quantity cm3/: 17.0...23.0 1000 s: (14.0...26.0) Spread cm3 : 8.001000 s: (12.00) Remarks: : MAN-NR. 2-7946 APPLICATION **Omnibus** 

1st version

Aneroid pressure h: 1200

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet :MB 9,5 a Edition : 07.04.89 : 11.85 Replaces Test oil : ISO-4113

Combination no. : 0 402 045 022

Injection pump

Pump designation: PES5P110A820LS434 EP type number : 0 412 015 020

Governor

Governor design. : RQ300/1100PA327-3

: 0 421 801 151 Governer no.

Customer-spec. information

Customer : DAIMLER-BENZ

Engine : 0M409

1st version kW : 141.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10

: (2.95...3.15) Rack travel in mm : 9.00...12.00

: 1-3-5-4-2 Firing order

Phasina : 0-72-144-216-288

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 5

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 11.40...11.50

Del.quantity cm3/: 11.8...12.0

100 s: (11.5...12.3)

cm3 : 0.4Spread

100 s: (0.8)

rpm : 300.02nd speed Rack travel in mm: 8.0...8.2 Del.quantity cm3/: 1.2...1.8

100 s: (0.9...2.0)

cm3 : 0.4Spread

100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 600

Rack travel in mm : 13.80...14.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Speed rpm : 1100

Del quantity : 118.0...120.0 1000 : (115.0...123.0)

Spread cm3 : 4.00

1000 : (8.00)

RATED SPEED

1st version

Setting point:

: 600 Speed rpm Rack travel in mm: 14.2

Testing:

+

1st rack travel in: 10.50

rpm : 1140...1150 Speed

2nd rack travel in: 4.00 rpm : 1170...1200 Speed LOW IDLE 1 Setting point w/out bumper spring Speed rpm: 300 Rack travel in mm: 8.1 Testing: Speed rpm: 100
Minimum rack trave: 10.00
Speed rpm: 300
Rack travel in mm: 8.00...8.20
Rack travel in mm: 2.00 rpm : 375...415 Speed FUEL DELIVERY CHARACTERISTICS 1st version rpm\_ : 600 Speed Del.quantity cm3/: 100.0...104.0 1000 s: (97.0...107.0) cm3 : 6.00 1000 s: (9.00) Spread **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.50 Speed rpm : 1140...1150 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 130.0...150.0 1000 s: (126.0...154.0) Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 3.00...3.10 : (2.95...3.15) Note remarks Rack travel in mm : 9.00...12.00 Firing order : 1-3-5-4-2 : MB 9,5 a 4 : 07.04.89 Test sheet Edition : 11.85 Replaces : ISO-4113 Test oil Phasing : 0-72-144-216-288 : 0 402 045 023 Combination no. Tolerance  $+ - \circ : 0.50 (0.75)$ Injection pump Time to cyl. no. : 5 Pump designation : PES5P110A820LS434 : 0 412 015 020 EP type number BASIC SETTING Governor Governor design. : RQ300/1100PA327-4 1st speed rpm: 1100 Governer no. : 0 421 801 173 Rack travel in mm : 10.40...10.50 Customer-spec. information Del.guantity cm3/: 11.0...11.2 Customer : DAIMLER-BENZ Engine : 0M409 100 s: (10.7...11.4) : 135.0 1st version kW Spread cm3 : 0.4Rated speed : 2200 100 s: (0.8) TEST BENCH REQUIREMENTS rpm : 300.02nd speed Test oil Rack travel in mm: 7.6...7.8 Del.quantity cm3/: 1.2...1.8 100 s: (0.9...2.0) inlet temp. °C : 38...42 Overflow valve Spread cm3 : 0.4: 1 417 413 025 100 s: (0.7) Inlet press., bar: 1.50 GUIDE SLEEVE POSITION Control-lever position Overflow Degree: -1 quantity min. 1/h: 100...120 Speed rpm: 600 Rack travel in mm: 13.80...14.60 Test nozzle holder : 0 681 343 009 FULL LOAD DELIV. AT FULL LOAD STOP assembly Opening 1st version pressure, bar : 172...175 rpm : 1100 Speed Del.quantity : 110.0...112.0 1000 : (107.5...114.5) Test lines : 1 680 750 015 : 4.00 Spread cm3 : (8.00) 1000 Outside diameter x Wall thickness RATED SPEED : 6.00x1.50x600 x Length mm 1st version (A) Injection pump setting values Insp. values in parentheses Setting point: Set equal delivery quant. Speed Speed rpm : 600 Rack travel in mm : 14.2 per values BEGINNING OF DELIVERY Testing:

1st rack travel in: 9.40

Speed

rpm : 1140...1150

Test pressure, bar: 25...27

2nd rack travel in: 4.00 rpm : 1170...1200 Speed 4th rack travel in: 1300 rpm : 0.00...1.50Speed LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 7.7 Testing: rpm : 100 Speed Minimum rack trave: 9.10 rpm : 300 Speed Rack travel in mm : 7.60...7.80 Rack travel in mm : 2.00 Speed rpm : 380...420 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 600 Del.quantity cm3/: 90.0...94.0 1000 s: (87.0...97.0) Spread cm3 : 6.001000 s: (9.00) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.40 Speed rpm : 1140...1150 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 130.0...150.0 1000 s: (126.0...154.0) Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet Edition : MB 9,5 a 9 : 07.04.89 Replaces Test oil : ISO-4113 Combination no. : 0 402 045 026 Injection pump Pump designation : PES5P110A820LS434 EP type number : 0 412 015 020 Governor Governor design. : RQ300/1100PA327-4 Governer no. : 0 421 801 173 Customer-spec. information Customer : DAIMLER-BENZ Engine : 0M409 : 135.0 1st version kW Rated speed : 2200 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Overflow quantity min. 1/h: 100...120 Test nozzle holder : 0 681 343 009 assembly Opening pressure, bar : 172...175 Test Lines : 1 680 750 015 Outside diameter x Wall thickness x Length mm

2nd speed rpm : 300.0 Rack travel in mm : 7.6...7.8 Del.quantity cm3/ : 1.2...1.8 100 s: (0.9...2.0) Spread cm3 : 0.4100 s: (0.7) GUIDE SLEEVE POSITION Control-lever position Degree: -1 Speed rpm : 600 Rack travel in mm : 13.80...14.60 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1100 Del.quantity : 110.0...112.0 1000 : (107.0...115.0) : 4.00 : (8.00) Spread cm3 1000 RATED SPEED : 6.00X1.50X600 1st version (A) Injection pump setting values Insp. values in parentheses Setting point: Set equal delivery quant. Speed rpm per values Rack travel in mm: 14.2 Testing: 1st rack travel in: 9.40 rpm : 1140...1150 Speed

Prestroke mm : 3.00...3.10 : (2.95...3.15) Rack travel in mm : 9.00...12.00 Firing order : 1-3-5-4-2

rpm: 1100

Rack travel in mm : 10.40...10.50

cm3 : 0.4

100 s: (0.8)

Del.quantity cm3/: 11.0...11.2

: 0-72-144-216-288

: 0.50 (0.75)

100 s: (10.7...11.5)

Phasing

Tolerance + - °

BASIC SETTING

1st speed

Spread

Time to cyl. no. : 5

2nd rack travel in: 4.00 rpm : 1170...1200 Speed 4th rack travel in: 1300 Speed rpm : 0.00...1.50 LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 7.7 Testing: rpm : 100 Speed Minimum rack trave: 9.10 Speed rpm: 300
Rack travel in mm: 7.60...7.80
Rack travel in mm: 2.00
Speed rpm: 380...420 FUEL DELIVERY CHARACTERISTICS 1st version **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.40 Speed rpm : 1140...1150 Speed STARTING FUEL DELIVERY rpm : 100 Del.quantity cm3/: 130.0...150.0 1000 s: (126.0...154.0) Remarks:

Prestroke mm : 3.00...3.10 : (2.95...3.15) Rack travel in mm : 9.00...12.00 Firing order : 1-3-5-4-2 BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet Edition : MB 9,5 a 10 : 07.02.89 Replaces Test oil : ISO-4113 Phasing : 0-72-144-216-288 Combination no. : 0 402 045 027 Tolerance  $+ - \circ : 0.50 (0.75)$ Injection pump Time to cyl. no. : 5 Pump designation : PES5P110A820LS434 EP type number : 0 412 015 020 BASIC SETTING Governor Governor design. : RQV300...1100PA594-1 rpm: 1100 1st speed Governer no. : 0 421 813 336 Rack travel in mm : 11.00...11.10 Customer-spec. information Customer : DAIMLER-BENZ Del.quantity cm3/: 11.0...11.2 Engine : 0M409 100 s: (10.7...11.5) 1st version kW : 135.0 Spread cm3 : 0.4: 2200 Rated speed 100 s: (0.8) TEST BENCH REQUIREMENTS rpm : 300.02nd speed Test oil Rack travel in mm: 8.0...8.2 inlet temp. °C Del.quantity cm3/: 1.2...1.8 100 s: (0.9...2.0) : 38...42 Overflow valve cm3 : 0.4Spread : 1 417 413 025 100 s: (0.7) Inlet press., bar: 1.50 GUIDE SLEEVE POSITION Control-lever position Overflow Degree: -1 quantity min. 1/h: 100...120 rpm : 1150 Speed Rack travel in mm : 15.20...17.80 Test nozzle holder : 0 681 343 009 FULL LOAD DELIV. AT FULL LOAD STOP assembly Opening 1st version pressure, bar : 172...175 Speed rpm : 1100 Del.quantity : 110.0...112.0 1000 : (107.0...115.0) Test lines : 1 680 750 015 : 4.00 Spread cm3 1000 : (8.00) Outside diameter x Wall thickness RATED SPEED x Length mm : 6.00x1.50x600 1st version (A) Injection pump setting values Control lever Insp. values in parentheses position degrees: 60...68

Testing:

Speed

1st rack travel in: 10.00

2nd rack travel in: 4.00

Speed rpm : 1140...1150

rpm : 1175...1205

MO5

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

4th rack travel in: 1300 Speed rpm : 0.00...1.00 LOW IDLE 1 Control lever position degrees: 30...38 Testing: Speed rpm : 100 Minimum rack trave: 9.50 Speed rpm : 300 Rack travel in mm : 8.00...8.20 CONSTANT REGULATION rpm : 320...435 Speed START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 600
Del.quantity cm3/: 91.0...95.0
1000 s: (88.0...98.0)
1000 s: (9.00) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.00 Speed rpm : 1140...1150 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 130.0...150.0 1000 s: (126.0...154.0) Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS : 2.80...2.90 Prestroke mm : (2.75...2.95) Rack travel in mm : 9.00...12.00 Firing order : 6-2-4-1-5-3 Note remarks Test sheet : MB 11,0 b 21.04.89 Edition : 7.85 Replaces Test oil : ISO-4113 Phasina : 0-60-120-180-240-300 Combination no. : 0 402 046 132 Tolerance + - 0 : 0.50 (0.75) Injection pump Time to cyl. no. : 6 Pump designation : PES6P100A820LS264Z EP type number : 0 412 006 026 BASIC SETTING Governor Governor design. : RQ300/1100PA327R 1st speed rpm: 1100 : 0 421 801 062 Governer no. Rack travel in mm : 12.70...12.80 Customer-spec. information Customer : DAIMLER-BENZ Del.quantity cm3/: 10.9...11.1 : OM 407 Engine 100 s: (10.7...11.3) 1st version kW : 154.5 Spread cm3 : 0.3Rated speed : 2200 100 s: (0.6) TEST BENCH REQUIREMENTS rpm : 300.0 2nd speed Test oil Rack travel in mm: 8.5...8.7 inlet temp. °C : 38...42 Del.quantity cm3/: 0.8...1.4 100 s: (0.5...1.6) Overflow valve Spread cm3 : 0.3: 1 417 413 025 100 s: (0.5) Inlet press., bar: 1.50 GUIDE SLEEVE POSITION Control-lever position Overflow Degree: -1 quantity min. 1/h: 100...120 rpm : 500 Speed Rack travel in mm : 13.80...14.60 Test nozzle holder : 0 681 343 009 assembly FULL LOAD DELIV. AT FULL LOAD STOP Openina 1st version pressure, bar : 172...175 Speed rpm : 1100 : 109.0...111.0 Del.quantity 1000 : (107.0...113.0) Test lines : 1 680 750 015 Spread : 3.00 cm3 : (6.00) 1000 Outside diameter x Wall thickness RATED SPEED : 6.00x1.50x600 x Length mm 1st version (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. Setting point: Speed rpm : 500 Rack travel in mm : 14.2 per values BEGINNING OF DELIVERY Testing:

1st rack travel in: 11.70

Speed

rpm : 1140...1150

Test pressure, bar: 25...27

2nd rack travel in: 4.00 Speed rpm: 1195...1225 4th rack travel in: 1350 Speed rpm : 0.00...1.50 LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 8.6 Testing: Speed rpm: 100
Minimum rack trave: 10.10
Speed rpm: 300
Rack travel in mm: 8.50...8.70
Rack travel in mm: 2.00
Speed rpm: 400...430 RACK STOP ADJUSTMENT Speed rpm : 500 BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.70 Speed rpm : 1140...1150 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 135.0...155.0 1000 s: (131.0...159.0) Remarks: APPLICATION Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS : 3.00...3.10 Prestroke mm : (2.95...3.15) Note remarks Rack travel in mm : 9.00...12.00 Firing order : 6-2-4-1-5-3 Test sheet : MB 11,4 b Edition : 21.04.89 Replaces : 12.9.86 Test oil : ISO-4113 : 0-60-120-180-240-300 Phasina Combination no. : 0 402 046 151 Tolerance + - 0 : 0.50 (0.75) Injection pump Time to cyl. no. : 6 Pump designation : PES6P100A820LS351Y EP type number : 0 412 006 030 BASIC SETTING Governor Governor design: : RQ300/1100PA327R 1st speed rpm: 1100 : 0 421 801 062 Governer no. Rack travel in mm : 11.70...11.80 Customer-spec, information Customer : DAIMLER-BENZ Del.quantity cm3/: 9.9...10.1 100 s: (9.7...10.3) : 0M 407 Engine : 147.1 1st version kW Spread cm3 : 0.3Rated speed : 2200 100 s: (0.6) TEST BENCH REQUIREMENTS 2nd speed rpm : 300.0Test oil Rack travel in mm: 7.5...7.7 inlet temp. °C : 38...42 Del.quantity cm3/: 0.5...1.1 100 s: (0.2...1.3) Overflow valve Spread cm3 : 0.3: 1 417 413 025 100 s: (0.5) Inlet press., bar: 1.50 GUIDE SLEEVE POSITION Control-lever position Overflow Degree: -1 quantity min. 1/h: 100...120 rpm : 500 Speed Rack travel in mm : 13.80...14.60 Test nozzle holder : 0 681 343 009 assembly FULL LOAD DELIV. AT FULL LOAD STOP Openina 1st version : 172...175 pressure, bar Speed rpm : 1100Del.quantity : 99.0...101.0 1000 : (97.0...103.0) Test Lines : 3.00 : 1 680 750 015 Spread cm3 1000 : (6.00) Outside diameter x Wall thickness RATED SPEED : 6.00x1.50x600 x Length mm 1st version (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. Setting point: Speed : 500 rpm Rack travel in mm: 14.2 per values BEGINNING OF DELIVERY Testing:

1st rack travel in: 10.70

Speed

rpm : 1140...1150

Test pressure, bar: 25...27

2nd rack travel in: 4.00 rpm : 1195...1225 Speed 4th rack travel in: 1350 Speed rpm : 0.00...1.50 LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 7.6 Testing: : 100 Speed rpm Minimum rack trave: 9.60 Speed rpm: 300
Rack travel in mm: 7.50...7.70
Rack travel in mm: 2.00
Speed rpm: 370...410 RACK STOP ADJUSTMENT rpm : 500 Speed **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.70 rpm : 1140...1150 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 130.0...150.0 1000 s: (126.0...154.0) Remarks: **APPLICATION** Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 3.00...3.10 : (2.95...3.15) Rack travel in mm : 9.00...12.00 Note remarks : 6-2-4-1-5-3 Firing order Test sheet : MB 11,4 p : 21.04.89 Edition : 11.85 Replaces Test oil : ISO-4113 Phasina : 0-60-120-180-240-300 Combination no. : 0 402 046 197 Tolerance + - 0 : 0.50 (0.75) Injection pump Time to cyl. no. : 6 Pump designation : PES6P100A820LS351 EP type number : 0 412 006 028 BASIC SETTING Governor Governor design. : RQ300/950PA483R 1st speed rpm: 950 Governer no. : 0 421 801 103 Rack travel in mm : 13.40...13.50 Customer-spec. information Customer : DAIMLER-BENZ Del.quantity cm3/: 12.5...12.7 Engine : 0M407H 100 s: (12.3...12.9) 1st version kW : 161.8 cm3 : 0.3Spread : 1900 Rated speed 100 s: (0.6) TEST BENCH REQUIREMENTS rpm : 300.0 2nd speed Test oil Rack travel in mm: 8.0...8.2 inlet temp. °C : 38...42 Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.2) Overflow valve cm3 : 0.3Spread : 1 417 413 025 100 s: (0.5) Inlet press., bar: 1.50 GUIDE SLEEVE POSITION Control-lever position Overflow Degree: -1 quantity min. 1/h: 100...120 Speed rpm : 600 Rack travel in mm : 13.80...14.60 Test nozzle holder : 0 681 343 009 FULL LOAD DELIV. AT FULL LOAD STOP assembly **Opening** 1st version rpm : 950 pressure, bar : 172...175 Speed : 125.0...127.0 Del.quantity 1000 : (123.0...129.0) Test lines : 1 680 750 015 : 3.00 Spread cm3 1000 : (6.00) Outside diameter x Wall thickness RATED SPEED x Length mm : 6.00x1,50x600 1st version (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. Setting point: : 600 Speed rpm Rack travel in mm: 14.2 per values BEGINNING OF DELIVERY Testina: Test pressure, bar: 25...27 1st rack travel in: 12.40

Speed

rpm : 990...1000

2nd rack travel in: 4.00 Speed rpm : 1015...1045 4th rack travel in: 1200 Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 8.1

Testing:

Speed rpm : 100 Minimum rack trave: 10.10 Speed rpm: 300
Rack travel in mm: 8.00...8.20
Rack travel in mm: 2.00
Speed rpm: 370...410

RACK STOP ADJUSTMENT

rpm : 600 Speed

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.40 Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...155.0 1000 s: (131.0...159.0)

Remarks:

**APPLICATION** 

Omnibus

## BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : ALO 13,8 e1 : 3.5.89 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 402 046 203

Injection pump

Pump designation : PES6P120A320RS411

Governor

Governor design. : RQV445...1250PA497K

Customer-spec. information

Customer : ALLIS CHALMERS

Engine : 6120 T

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 40...45

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.5

Test nozzle holder

: 0 681 443 022 assembly

**Opening** 

: 172...175 pressure, bar

Test Lines : 1 680 750 060

Outside diameter x Wall thickness

x Length mm : 8,00x2,00x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

: 2.80...2.90 Prestroke mm

: (2.75...2.95)

Rack travel in mm: 10.50

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1250

Rack travel in mm : 10.30...10.40

Del.quantity cm3/: 18.6...18.8

100 s: (-)

Spread cm3 : 0.5

100 s: (-)

rpm : 445 2nd speed

Rack travel in mm : 5.70...5.90

Del.quantity cm3/: 1.9...2.5

100 s: (-)

cm3 : 0.8 Spread

100 s: (-)

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1250 Speed

Rack travel in mm : 15.50...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 186.5...188.5

1000 : (-) cm3 : 5.0

Spread 1000 : (-)

RATED SPEED

1st version

Control lever

position degrees: 56...62

Testina:

1st rack travel in: 9.30

rpm : 1290...1300 Speed

2nd rack travel in: 4.00

: 1385...1415 Speed rpm

4th rack travel in: 1450

Speed rpm : 0.30...1.70

LOW IDLE 1

Control Lever

position degrees: 15.5...21.5

Testina:

rpm Speed

Minimum rack trave: 7.30

Speed rpm : 445
Rack travel in mm : 5.70...5.90
Rack travel in mm : 2.00
Speed rpm : 705...765 TORQUE CONTROL Dimension a mm : 0.60 Torque control curve - 1st version 1st speed rpm : 1250
Rack travel in m: 10.20...10.30 2nd speed rpm : 800 Rack travel in m: 10.80...10.90 FUEL DELIVERY CHARACTERISTICS 1st version rpm\_ : 800 Speed Del.quantity cm3/: 184.4...188.5 1000 s: (-) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.30 rpm : 1290...1300 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 210.0...250.0 1000 s: (-) LOW IDLE Speed rpm : 445 Del.quantity cm3/ : 19.0...25.0 1000 s: (-) Remarks: **APPLICATION** Tractor (tractor engines)

BOSCH INJ. PUMP TEST SPECIFICATIONS : 3.00...3.10 : (2.95...3.15) Prestroke mm Rack travel in mm : 9.00...12.00 Firing order : 6-2-4-1-5-3 Note remarks Test sheet : MAN 11,1 q7 Edition : 11.01.88 Replaces : 10.85 Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 402 046 208 Tolerance + - ° : 0.50 (0.75) Injection pump Time to cyl. no. : 6 Pump designation : PES6P120A720LS388 : 0 412 026 030 EP type number BASIC SETTING Governor Governor design. : RQ250/1100PA509 1st speed rpm: 750 : 0 421 801 117 Governer no. Rack travel in mm : 11.40...11.50 Customer-spec. information Customer : MAN Del.quantity cm3/: 17.8...18.0 : D2566MKF Engine 100 s: (17.5...18.3) 1st version kW : 206.0 Spread cm3 : 0.5Rated speed : 2200 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 250.0 2nd speed Test oil Rack travel in mm: 6.2...6.4 inlet temp. °C : 38...42 Del.quantity cm3/: 1.2...1.8 100 s: (0.9...2.1) Overflow valve cm3 : 0.8 100 s: (1.2) Spread : 1 417 413 025 Inlet press., bar: 1.50 GUIDE SLEEVE POSITION Control-lever position Test nozzle holder Degree: -2 : 1 688 901 019 assembly rpm : 600 Speed Rack travel in mm : 19.20...20.80 Openina : 207...210 pressure, bar FULL LOAD DELIV. AT FULL LOAD STOP Orifice plate 1st version diameter mm : 0,8 Speed rpm : 750 Aneroid pressure h: 700 Del.quantity : 178.0...180.0 1000 : (175.0...183.0) Test Lines : 1 680 750 067 : 5.00 cm3 Spread 1000 : (9.00) x Length mm : 6.00X1.50X1000 RATED SPEED

Outside diameter x Wall thickness

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

Setting point: rom Rack travel in mm: 20.0 Testing:

1st version

1st rack travel in: 9.20

Speed rpm : 1100 Del.quantity cm3/ : 160.0...166.0 1000 s: (157.0...169.0) Speed rpm : 1145...1160 2nd rack travel in: 4.00 Speed rpm : 1180...1210 4th rack travel in: 1400 Aneroid pressure h: 700 rpm : 0.00...1.00Speed Speed rpm : 650 Del.quantity cm3/: 171.0...177.0 LOW IDLE 1 1000 s: (168.0...180.0) Setting point w/out bumper spring Aneroid pressure h: 310 Speed rpm : 500 Del.quantity cm3/ : 131.0...137.0 1000 s: (128.0...140.0) : 250 Speed rpm Rack travel in mm: 6.3 Testina: Aneroid pressure h: -Speed rpm: 500
Del.quantity cm3/: 104.0...106.0
1000 s: (101.0...109.0) Speed rpm : 100 Minimum rack trave: 7.80 Speed rpm : 250 Rack travel in mm : 6.20...6.40 Rack travel in mm : 2.00 Speed rpm : 335...375 **BREAKAWAY** TORQUE CONTROL 1st version Dimension a mm : 0.50 1mm rack travel less than Torque control curve - 1st version 1st speed rpm : 750 full load rack tr: 9.20 Rack travel in m: 11.40...11.50 Speed rpm : 1145...1160 2nd speed rpm : 1100 Rack travel in m: 10.20...10.30 STARTING FUEL DELIVERY 3rd speed rpm : 875 Rack travel in m: 11.10...11.30 4th speed rpm : 985 Speed : 100 rpm Del.quantity cm3/: 205.0...225.0 1000 s: (201.0...229.0) Rack travel in m: 10.40...10.70 Aneroid/Altitude Compensator Test LOW IDLE Speed rpm : 250 Rack travel in mm : 6.20...6.40 1st version Settina Del.quantity cm3/: 12.0...18.0 1000 s: (9.0...21.0) rpm : 500 hPa : 700 Speed Pressure Spread cm3 : 8.00: 11.40...11.50 Rack travel mm 1000 s: (12.00) Measurement Remarks: Speed 1/min: 500 1st pressure hPa : -Rack travel in m: 9.20...9.30 2nd pressure hPa : 310 Rack travel in m: 10.30...10.40 3rd pressure hPa : 430 Rack travel in m: 10.90...11.10 START CUT-OUT Speed 1/min: 170 (190) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700

M16

Prestroke mm : 3.00...3.10 : (2.95...3.15) Rack travel in mm : 9.00...12.00 Firing order : 6-2-4-1-5-3 BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MAN 11,1q26 Edition : 11.01.88 Replaces Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 402 046 209 Tolerance + - ° : 0.50 (0.75) Injection pump Time to cyl. no. : 6 Pump designation : PES6P120A720LS388 EP type number : 0 412 026 030 BASIC SETTING Governor Governor design. : RQ250/1100PA509 1st speed rpm: 750 Governer no. : 0 421 801 117 Rack travel in mm : 11.40...11.50 Customer-spec, information Customer : MAN Del.quantity cm3/: 17.8...18.0 Engine : D2566MK 100 s: (17.5...18.3) : 206.0 : 2200 1st version kW Spread cm3 : 0.5Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 250.0 2nd speed Test oil Rack travel in mm: 6.2...6.4 Del.quantity cm3/: 1.2...1.8 100 s: (0.9...2.1) inlet temp. °C : 38...42 cm3 : 0.8 100 s: (1.2) Overflow valve Spread : 1 417 413 025 Inlet press., bar: 1.50 GUIDE SLEEVE POSITION Control-lever position Test nozzle holder Degree: -2 assembly : 1 688 901 019 rpm : 600 Speed Rack travel in mm : 19.20...20.80 **Opening** : 207...210 FULL LOAD DELIV. AT FULL LOAD STOP pressure, bar Orifice plate 1st version diameter mm : 0,8 Speed rom : 750 Aneroid pressure h: 700 Del.quantity : 178.0...180.0 Test lines : 1 680 750 067 1000 : (175.0...183.0) : 5.00 Spread cm3 1000 : (9.00) Outside diameter : 6.00x1.50x1000 RATED SPEED

x Wall thickness x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27 Setting point: Speed rpm Rack travel in mm : 20.0 Testina: 1st rack travel in: 9.20

1st version

rpm : 1145...1160 Speed 2nd rack travel in: 4.00 Speed rpm : 1180...1210 4th rack travel in: 1400 rom : 0.00...1.00Speed LOW IDLE 1 Setting point w/out bumper spring Speed rpm Rack travel in mm: 6.3 Testina: Speed rpm : 100 Minimum rack trave: 7.80 : 250 rpm Rack travel in mm : 6.20...6.40 Rack travel in mm: 2.00 rom : 335...375 Speed TORQUE CONTROL Dimension a mm : 0.50 Torque control curve - 1st version 1st speed rpm : 750 Rack travel in m: 11.40...11.50 2nd speed rpm : 1100 Rack travel in m: 10.20...10.30 3rd speed rpm : 875 Rack travel in m: 11.10...11.30 4th speed rpm : 985 Rack travel in m: 10.40...10.70 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rpm Pressure hPa : 700 Rack travel mm : 11.40...11.50 Measurement 1/min : 500 Speed 1st pressure hPa : -Rack travel in m: 9.20...9.30 2nd pressure hPa : 310 Rack travel in m: 10.30...10.40 3rd pressure hPa : 430 Rack travel in m: 10.90...11.10 START CUT-OUT 1/min: 170 (190) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700

#### BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 9.20 Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 205.0...225.0 1000 s: (201.0...229.0)

### LOW IDLE

Speed rpm : 250
Rack travel in mm : 6.20...6.40
Del.quantity cm3/ : 12.0...18.0
1000 s: (9.0...21.0)
Spread cm3 : 8.00

Spread cm3 : 8.00 1000 s: (12.00)

Remarks:

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M18

BOSCH INJ. PUMP TEST SPECIFICATIONS Firing order : 1-5-3-6-2-4 Note remarks Test sheet : FIA 13,8 s1 Phasing : 0-60-120-180-240-300 Edition : 10.02.89 Replaces : 4.84 Tolerance + - 0 : 0.50 (0.75) Test oil : ISO-4113 Time to cyl. no. : 1 Combination no. : 0 402 046 227 BASIC SETTING Injection pump Pump designation : PES6P120A820LS249Y 1st speed rom: 1000 EP type number : 0 412 026 041 Governor Rack travel in mm : 9.10...9.20 Governor design. : RQV300...1000PA204/4 Governer no. : 0 421 813 121 Del.quantity cm3/: 16.6...17.0 Customer-spec. information 100 s: (16.3...17.3) Customer : IVECO-FIAT Spread cm3 : 0.5Engine : 8217.32.110 100 s: (0.9) : 161.8 1st version kW Rated speed : 2000 2nd speed rpm : 300.0 Rack travel in mm: 5.9...6.1 Del.quantity cm3/ : 2.2...3.0 TEST BENCH REQUIREMENTS 100 s: (1.9...3.3) Test oil Spread cm3 : 0.6inlet temp. °C : 38...42 100 s: (0.9) Overflow valve (B) Setting of injection pump : 1 417 413 025 with governor Inlet press., bar: 1.50 GUIDE SLEEVE TRAVEL rpm : 300 1st speed Test nozzle holder : 1.90...2.40 travel mm assembly : 0 681 443 022 2nd speed rpm : 450 : 3.50...4.20 travel mm Opening rpm : 800 3rd speed pressure, bar : 172...175 : 6.30...6.70 travel mm rpm : 1000 4th speed : 7.80...8.00 travel mm Test lines : 1 680 750 060 5th speed rpm : 1350 : 11.00...12.00 travel mm Outside diameter x Wall thickness GUIDE SLEEVE POSITION x Length mm : 8.00X2.00X1000 Control-lever position Degree: -1 (A) Injection pump setting values rpm. : 1035 Speed Insp. values in parentheses Rack travel in mm : 15.20...17.80 Set equal delivery quant. FULL LOAD DELIV. AT FULL LOAD STOP per values BEGINNING OF DELIVERY 1st version Test pressure, bar: 25...27 Speed rpm : 1000 Del.quantity : 166.0...170.0 1000 : (163.0...173.0) Prestroke mm : 2.00...2.10 : (1.95...2.15) Spread cm3 : 5.00 Rack travel in mm : 9.00...12.00 : (9.00) 1000

M19

### RATED SPEED

1st version Control Lever

position degrees: 54...62

Testing:

1st rack travel in: 8.10

rpm : 1040...1050 Speed

2nd rack travel in: 4.00

Speed rpm : 1115...1145 4th rack travel in: 1300

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 10...18

Testing:

rpm : 100 Speed Minimum rack trave: 7.50

Speed rpm : 300 Rack travel in mm : 5.90...6.10

CONSTANT REGULATION

Speed rpm : 300...395

#### **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 8.10 Speed rpm : 1040...1050 Speed

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

## **APPLICATION**

Rail car

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB 11,4 L 2 Edition : 14.04.89 : 11.85 Replaces Test oil : ISO-4113 Combination no. : 0 402 046 236 Injection pump Pump designation : PES6P110A820LS442 EP type number : 0 412 016 060 Governor Governor design. : RQ300/950PA483R : 0 421 801 103 Governer no. Customer-spec. information Customer : DAIMLER-BENZ Engine : 0M407 1st version kW : 162.0 Rated speed : 1900 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Overflow quantity min. 1/h: 100...120 Test nozzle holder : 0 681 343 009 assembly Opening : 172...175 pressure, bar Test lines : 1 680 750 015

Outside diameter x Wall thickness : 6.00X1,50X600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

Prestroke mm : 3.20...3.30 : (3.15...3.35) Rack travel in mm : 9.00...12.00 Firing order : 6-2-4-1-5-3 Phasing : 0-60-120-180-240-300 Tolerance + - 0 : 0.50 (0.75) Time to cyl. no. : 6 BASIC SETTING 1st speed rpm: 950 Rack travel in mm : 12.10...12.20 Del.quantity cm3/: 12.2...12.4 100 s: (11.9...12.7) Spread cm3 : 0.4100 s: (0.8) 2nd speed rpm : 300.0 Rack travel in mm : 8.0...8.2 Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.2) cm3 : 0.4Spread 100 s: (0.7) GUIDE SLEEVE POSITION Control-lever position Degree: -1 Speed rpm : 600 Rack travel in mm : 13.00...14.00 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 950 Speed Del.quantity 122.0...124.0 1000 : (119.0...127.0) : 4.00 Spread cm3 1000 : (8.00) RATED SPEED 1st version Setting point: Speed rpm Rack travel in mm: 13.5 Testing:

1st rack travel in: 11.10

rpm : 990...1000

Speed

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

2nd rack travel in: 4.00 Speed rpm : 1010...1040 4th rack travel in: 1150 Speed rpm : 0.00...1.50 LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 8.1 Testing: rpm : 100 Speed Minimum rack trave: 9.70 Speed rpm : 300 Rack travel in mm : 8.00...8.20 Rack travel in mm: 2.00 Speed rpm : 410...450 FUEL DELIVERY CHARACTERISTICS 1st version rpm\_ : 600 Speed Del.quantity cm3/: 118.0...122.0 1000 s: (115.0...125.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.10 Speed rpm : 990...1000 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 140.0...160.0 1000 s: (136.0...164.0) Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB 11,4 h Edition : 14.04.89 Replaces : 11.85 Test oil : ISO-4113 Combination no. : 0 402 046 239 Injection pump Pump designation : PES6P110A820LS422 EP type number : 0 412 016 057 Governor Governor design. : RQ300/1100PA327-1 : 0 421 801 140 Governer no. Customer-spec, information Customer : DAIMLER-BENZ Engine : OM 407 H 1st version kW : 147.0 Rated speed : 2200 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 quantity min. 1/h: 100...120 : 0 681 343 009 assembly : 172...175 pressure, bar : 1 680 750 015

Overflow Test nozzle holder Openina | Test lines Outside diameter x Wall thickness x Length mm : 6.00x1.50x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

: 3.00...3.10 : (2.95...3.15) Prestroke mm Rack travel in mm : 9.00...12.00 Firing order : 6-2-4-1-5-3 Phasing : 0-60-120-180-240-300 Tolerance + - 0 : 0.50 (0.75) Time to cyl. no. : 6 BASIC SETTING 1st speed rpm: 1100 Rack travel in mm : 10.60...10.70 Del.quantity cm3/: 10.3...10.5 100 s: (10.0...10.8) cm3 : 0.4Spread 100 s: (0.8) 2nd speed rpm : 300.0 Rack travel in mm : 8.2...8.4 Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.2) cm3 : 0.4Spread 100 s: (0.7) GUIDE SLEEVE POSITION Control-lever position Degree: -1 Speed rpm : 600 Rack travel in mm : 13.00...14.00 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1100 Del.quantity : 103.0...105.0 1000 : (100.0...108.0) Spread cm3 : 4.00 1000 : (8.00) RATED SPEED 1st version Setting point: Speed rpm Rack travel in mm: 13.5

BEGINNING OF DELIVERY Test pressure, bar: 25...27

Testing: 1st rack travel in: 9.60 rpm : 1140...1150 Speed

2nd rack travel in: 4.00 rpm : 1170...1200 Speed 4th rack travel in: 1350 rpm : 0.00...1.50Speed LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 6.1 Testing: Speed : 100 rpm Minimum rack trave: 7.50
Speed rpm: 300
Rack travel in mm: 6.00...6.20
Rack travel in mm: 2.00
Speed rpm: 350...390 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 500 Del.quantity cm3/ : 75.0...79.0 1000 s: (72.0...82.0) cm3 : 6.00 1000 s: (9.00) Spread RACK STOP ADJUSTMENT Speed rpm : 500 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.60 rpm : 1140...1150 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 130.0...150.0 1000 s: (126.0...154.0) Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB 11,4 L 5 Edition : 29.03.89 Replaces : 12.1.89 Test oil : ISO-4113 : 0 402 046 240 Combination no. Injection pump Pump designation : PES6P110A820LS442 EP type number : 0 412 016 060 Governor Governor design. : RQ300/1100PA327-5 : 0 421 801 163 Governer no. Customer-spec. information Customer : DAIMLER-BENZ : OM 407 Engine 1st version kW : 162.0 : 2200 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 : 1 417 413 025 quantity min. 1/h: 100...120 assembly : 0 681 343 009 : 172...175 pressure, bar : 1 680 750 015

Overflow valve Inlet press., bar: 1.50 Overflow Test nozzle holder Openina Test lines Outside diameter x Wall thickness : 6.00x1.50x600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 3.20...3.30 : (3.15...3.35) Prestroke mm Rack travel in mm : 9.00...12.00 Firina order : 6-2-4-1-5-3 Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 6 BASIC SETTING rpm: 1100 1st speed Rack travel in mm : 10.90...11.00 Del.quantity cm3/: 11.3...11.5 100 s: (11.0...11.8) cm3 : 0.4Spread 100 s: (0.8) 2nd speed rpm : 300.0Rack travel in mm: 8.2...8.4 Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.2) cm3 : 0.4 100 s: (0.7) Spread GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 600 Rack travel in mm : 13.00...14.00 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1100 : 113.0...115.0 Del.quantity 1000 : (110.0...118.0) Spread cm3 : 4.00 1000 : (8.00) RATED SPEED 1st version Setting point: Speed rom Rack travel in mm: 13.5 Testing: 1st rack travel in: 9.90

rpm : 1140...1150

2nd rack travel in: 4.00 Speed rpm : 1190...1220 4th rack travel in: 1350 Speed rpm : 0.00...1.50 LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 7.4 Testing: Speed : 100 rpm Minimum rack trave: 9.00 Speed rpm : 300 Rack travel in mm : 7.30...7.50
Rack travel in mm : 2.00
Speed rpm : 365...405 FUEL DELIVERY CHARACTERISTICS 1st version Speed : 600 rpm Del.quantity cm3/: 90.0...94.0 1000 s: (87.0...97.0) Spread cm3 : 6.001000 s: (9.00) RACK STOP ADJUSTMENT Speed rom : 500 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.90 Speed rpm : 1140...1150 STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 130.0...150.0 1000 s: (126.0...154.0) Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS : 3.00...3.10 Prestroke mm : (2.95...3.15)
Rack travel in mm : 9.00...12.00 Note remarks : 6-2-4-1-5-3 Firing order Test sheet : MB 11,4 h 1 Edition : 14.04.89 Replaces : 11.85 Test oil : ISO-4113 Phasina : 0-60-120-180-240-300 Combination no. : 0 402 046 243 Tolerance + - 0 : 0.50 (0.75) Injection pump Time to cyl. no. : 6 Pump designation : PES6P110A820LS422 EP type number : 0 412 016 057 BASIC SETTING Governor Governor design. : RQ300/950PA483-1 1st speed rpm: 950 Governer no. : 0 421 801 185 Rack travel in mm : 11.00...11.10 Customer-spec. information Customer : DAIMLER-BENZ Del.quantity cm3/: 10.2...10.4 Engine : OM 407 100 s: (9.9...10.7) 1st version kW : 137.0 Spread cm3 : 0.4Rated speed : 1900 100 s: (0.8) TEST BENCH REQUIREMENTS 2nd speed rpm : 300.0 Rack travel in mm : 7.8...8.0 Test oil inlet temp. °C : 38...42 Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.2) cm3 : 0.4 100 s: (0.7) Overflow valve Spread : 1 417 413 025 Inlet press., bar: 1.50 GUIDE SLEEVE POSITION Control-lever position Overflow Degree: -2 quantity min. 1/h: 100...120 rpm : 600 Speed Rack travel in mm : 13.00...13.80 Test nozzle holder : 0 681 343 009 assembly FULL LOAD DELIV. AT FULL LOAD STOP Openina 1st version pressure, bar : 172...175 Speed rpm : 950 : 102.0...104.0 Del.quantity 1000 : (99.0...107.0) Test lines : 1 680 750 015 : 4.00 Spread cm3 1000 : (8.00) Outside diameter x Wall thickness RATED SPEED : 6.00x1.50x600 x Length mm 1st version (A) Injection pump setting values Insp. values in parentheses Setting point: Set equal delivery quant. Speed per values Rack travel in mm: 13.4

Testing:

Speed

1st rack travel in: 10.00

rpm : 990...1000

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

2nd rack travel in: 4.00 Speed rpm : 1010...1040 4th rack travel in: 1150 rpm : 0.00...1.50 Speed LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 7.9 Testing: Speed rpm : 100 Minimum rack trave: 9.50 Speed rpm : 300 Rack travel in mm : 7.80...8.00 Rack travel in mm : 2.00 Speed rpm : 375...415 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 600 Del.quantity cm3/ : 93.0...97.0 1000 s: (90.0...100.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.00 Speed rpm : 990...1000 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 135.0...155.0 1000 s: (131.0...159.0) Remarks: APPLICATION **Omnibus** 

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : RVI 8,8 b 2 Edition : 29.03.89 : 12.11.87 Replaces Test oil : ISO-4113

Combination no. : 0 402 046 247

Injection pump

Pump designation : PES6P120A320RS417 EP type number : 0 412 026 036

Governor

: RQV300...1150PA527-1 Governor design.

: 0 421 815 165 Governer no.

Customer-spec. information Customer : RVI

Engine : MIDR 062030

### TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0.8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00X1.50X1000 x Lenath mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

: 1-5- 3- 6- 2- 4 Firing order

Phasina : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

### BASIC SETTING

1st speed rpm: 1150

Rack travel in mm : 8.50...8.60

Del.quantity cm3/: 14.4...14.6

100 s: (14.1...14.9)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 600.02nd speed Rack travel in mm: 5.2...5.4 Del.quantity cm3/: 1.8...2.4

100 s: (1.5...2.7)

Spread cm3 : 0.8 100 s: (1.2)

(B) Setting of injection pump with governor

# GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.70...2.10

rpm : 900 2nd speed

: 5.80...6.20 travel mm

: 1150 3rd speed rpm travel mm : 8.00...8.20

GUIDE SLEEVE POSITION Control-lever position Degree: -1

Speed rpm : 1190 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1150 Speed

Del.quantity : 144.0...146.0

1000 : (141.0...149.0)

: 5.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version

Control Lever position degrees: 52...60 Testing: 1st rack travel in: 7.50 rpm : 1205...1215 Speed 2nd rack travel in: 4.00 Speed rpm : 1260...1290 4th rack travel in: 1450 Speed rom : 0.00...1.00 LOW IDLE 1 Control lever position degrees: 62...70 Testing: Speed rpm : 100 Minimum rack trave: 6.30 Speed rpm : 300 Rack travel in mm : 3.30...3.50 Rack travel in mm: 2.00 CONSTANT REGULATION rpm : 320...440 Speed TORQUE CONTROL Dimension a mm : 1.80 Torque control curve - 1st version 1st speed rpm : 1150 Rack travel in m: 8.50...8.60 2nd speed rpm : 750 Rack travel in m: 7.60...7.70 3rd speed rpm : 500 Rack travel in m: 7.00...7.20 rpm : 350 4th speed Rack travel in m: 6.70...7.10 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version rpm : 750 Speed Del.quantity cm3/: 122.0...128.0 1000 s: (119.0...131.0) rpm : 500 Speed Del.quantity cm3/: 69.0...75.0 1000 s: (66.0...78.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 7.50

Speed rpm : 1205...1215

NO2

### STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 140.0...160.0 1000 s: (136.0...164.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 3.30...3.50
Del.quantity cm3/ : 18.0...24.0
1000 s: (15.0...27.0)

Spread cm3 : 8.00 1000 s: (12.00)

Remarks:

Start-of-delivery mark 6° cam angle after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS : 3.00...3.10 : (2.95...3.15) Prestroke mm Rack travel in mm : 9.00...12.00 Note remarks : 6-2-4-1-5-3 Firing order : MB 11,4 h 2 Test sheet Edition : 14.04.89 Replaces : 11.85 : ISO-4113 Test oil Phasing : 0-60-120-180-240-300 Combination no. : 0 402 046 269 Tolerance + - 0 : 0.50 (0.75) Injection pump Time to cyl. no. : 6 Pump designation : PES6P110A820LS422 EP type number : 0 412 016 057 BASIC SETTING Governor Governor design. : RQ300/1100PA681 1st speed rpm: 1100 : 0 421 801 222 Governer no. Rack travel in mm : 10.60...10.70 Customer-spec. information Del.quantity cm3/: 10.3...10.5 Customer : DAIMLER-BENZ Engine : OM 407 100 s: (10.0...10.8) 1st version kW : 147.0 Spread cm3 : 0.4Rated speed : 2200 100 s: (0.8) TEST BENCH REQUIREMENTS rpm : 300.02nd speed Test oil Rack travel in mm: 8.0...8.2 inlet temp. °C : 38...42 Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.2) cm3 : 0.4 100 s: (0.7) Overflow valve Spread : 1 417 413 025 Inlet press., bar: 1.50 GUIDE SLEEVE POSITION Control-lever position Overflow Degree: -1 quantity min. 1/h: 100...120 rpm : 600 Speed Rack travel in mm : 13.00...14.00 Test nozzle holder : 0 681 343 009 FULL LOAD DELIV. AT FULL LOAD STOP assembly **Opening** 1st version : 172...175 pressure, bar Speed rpm : 1100 Del.quantity : 103.0...105.0 1000 : (100.0...108.0) Test lines : 1 680 750 015 cm3 : 4.00 1000 : (8.00) Spread Outside diameter x Wall thickness RATED SPEED x Length mm : 6.00x1.50x600 1st version (A) Injection pump setting values Insp. values in parentheses Setting point: Set equal delivery quant. Speed rpm : 600 Rack travel in mm: 13.5 per values BEGINNING OF DELIVERY Testing: Test pressure, bar: 25...27 1st rack travel in: 9.60

rpm : 1140...1150

2nd rack travel in: 4.00 rpm : 1175...1205 Speed 4th rack travel in: 1350 Speed rpm : 0.00...1.50 LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 6.1 Testing: Speed rpm : 100 Minimum rack trave: 7.50 Speed rpm : 300 Rack travel in mm : 6.00...6.20 Rack travel in mm : 2.00 : 350...390 Speed LDW FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 500 Del.quantity cm3/: 76.0...80.0 1000 s: (73.0...83.0) Spread cm3 : 6.001000 s: (9.00) RACK STOP ADJUSTMENT Speed rpm : 500 BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 9.60 Speed rpm : 1140...1150 STARTING FUEL DELIVERY rpm : 100 Speed

Del.quantity cm3/: 130.0...150.0

1000 s: (126.0...154.0)

Remarks:

**APPLICATION** 

**Omnibus** 

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MAN 11,4 f : 29.03.89 Edition : 11.85 Replaces Test oil : ISO-4113 Combination no. : 0 402 046 287 Injection pump Pump designation : PES6P100A720LS471 EP type number : 0 412 006 034 Governor Governor design. : RQ250/1100PA685 : 0 421 801 227 Governer no. Customer-spec. information Customer : MAN Engine : D2566UH/200 1st version kW : 147.0 Rated speed : 2200 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 009 assembly Opening pressure, bar : 172...175 Test Lines : 1 680 750 015 Outside diameter x Wall thickness : 6.00X1.50X600 x Length mm (A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

Prestroke mm : 3.10...3.20 : (3.05...3.25) Rack travel in mm : 9.00...12.00

Firing order : 6-2-4-1-5-3

Phasina : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

1st speed rpm: 750

Rack travel in mm : 12.30...12.40

Del.quantity cm3/: 9.4...9.6

100 s: (9.2...9.8)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 250.02nd speed Rack travel in mm: 4.9...5.1 Del.quantity cm3/: 1.2...1.8 100 s: (0.9...2.0)

Spread cm3 : 0.3100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 600

Rack travel in mm : 15.60...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Speed Del.quantity 10<u>0</u>0 : 94.0...96.0 : (92.0...98.0)

3.50 cm3 Spread

1000 : (6.00)

RATED SPEED

1st version

Setting point:

Speed rpm Rack travel in mm: 16.0

Testing:

1st rack travel in: 11.20

rpm : 1145...1160 Speed

2nd rack travel in: 4.00

Speed : 1215...1245 man

4th rack travel in: 1350

N<sub>0</sub>5

: 0.00...1.00 Speed rom LOW IDLE 1 Setting point w/out bumper spring rpm : 250 Rack travel in mm: 5.0 Testing: Speed : 100 rpm Minimum rack trave: 6.50 Speed rpm : 250 Rack travel in mm : 4.90...5.10 Rack travel in mm : 2.00 Speed rpm : 340...380 TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 700 Rack travel in m: 12.30...12.40 2nd speed rpm : 1100 Rack travel in m: 12.20...12.40 FUEL DELIVERY CHARACTERISTICS 1st version : 500 Speed rpm Del.quantity cm3/: 85.0...88.0 1000 s: (82.5...90.5) Speed rpm : 1100 Del.quantity cm3/ : 100.0...104.0 1000 s: (97.5...106.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.20 rpm : 1145...1160 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 115.0...135.0 1000 s: (111.0...139.0) LOW IDLE : 250 Speed rpm Rack travel in mm: 4.90...5.10 Del.quantity cm3/: 12.0...18.0 1000 s: (9.5...20.5) cm3 : 3.50Spread 1000 s: (5.50)

APPLICATION

**Omnibus** 

N06

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS : 3.20...3.30 Prestroke mm : (3.15...3.35) Note remarks Rack travel in mm : 9.00...12.00 : 6-2-4-1-5-3 Firing order Test sheet : MB 11,4 L 9 : 14.04.89 Edition : 11.85 Replaces : ISO-4113 Test oil Phasing : 0-60-120-180-240-300 Combination no. : 0 402 046 298 Tolerance + - 0 : 0.50 (0.75) Injection pump Time to cyl. no. : 6 Pump designation : PES6P110A820LS442 EP type number : 0 412 016 060 BASIC SETTING Governor Governor design. : RQ250/1100PA327-8 1st speed rpm: 1100 Governer no. : 0 421 801 256 Rack travel in mm : 10.90...11.00 Customer-spec. information Customer Del.quantity cm3/: 11.3...11.5 : DAIMLER-BENZ Engine : 407 STEHEND 100 s: (11.0...11.7) 1st version kW : 162.0 Spread cm3 : 0.4Rated speed : 2200 100 s: (0.8) TEST BENCH REQUIREMENTS rpm : 250.02nd speed Test oil Rack travel in mm: 8.0...8.2 Del.quantity cm3/: 1.2...1.8 100 s: (0.9...2.0) inlet temp. °C : 38...42 Overflow valve cm3 : 0.4Spread : 1 417 413 025 100 s: (0.7) Inlet press., bar: 1.50 GUIDE SLEEVE POSITION Control-lever position Degree: -1
Speed rpm : 550
Rack travel in mm : 13.00...14.00 Overflow quantity min. 1/h: 100...120 Test nozzle holder : 0 681 343 039 assembly FULL LOAD DELIV. AT FULL LOAD STOP Openina 1st version : 172...175 pressure, bar rpm : 1100 Speed : 113.0...115.0 Del.quantity 1000 : (110.5...117.5) Test Lines : 1 680 750 015 : 4.00 Spread ത്രാ 1000 : (8.00) Outside diameter x Wall thickness RATED SPEED x Length mm : 6.00x1.50x600 1st version (A) Injection pump setting values Insp. values in parentheses Setting point: Speed rpm : 550 Rack travel in mm : 13.5 Set equal delivery quant. per values \_\_\_\_ BEGINNING OF DELIVERY Testing:

1st rack travel in: 9.90

rpm : 1140...1150

Speed

Test pressure, bar: 25...27

2nd rack travel in: 4.00 Speed rpm : 1175...1205 4th rack travel in: 1300

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 250 Rack travel in mm : 7.6

Testing:

Speed : 100 rpm Minimum rack trave: 9.00 rpm : 250 Speed

Rack travel in mm : 7.50...7.70

Rack travel in mm : 2.00 Speed rpm : 330...370

FUEL DELIVERY CHARACTERISTICS

1st version

Speed : 600 rpm

Del.quantity cm3/: 90.0...94.0 1000 s: (87.0...97.0)

Spread cm3 : 6.00

1000 s: (9.00)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 9.90

Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 130.0...150.0 1000 s: (126.0...154.0)

:

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB 11,4 L19 Edition : 14.04.89 Replaces : 19.5.88 Test oil : ISO-4113 Combination no. : 0 402 046 299 Injection pump Pump designation : PES6P110A820LS442 : 0 412 016 060 EP type number Governor Governor design. : RQ250/950PA483-3 : 0 421 801 363 Governer no. Customer-spec, information Customer : DAIMLER-BENZ Engine : 0M407 1st version kW : 147.0 : 1900 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Overflow quantity min. 1/h: 100...120 Test nozzle holder : 0 681 343 009 assembly Opening pressure, bar : 172...175 Test Lines : 1 680 750 015 Outside diameter x Wall thickness

: 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: (3.15...3.35) Rack travel in mm : 9.00...12.00 Firing order : 6-2-4-1-5-3 Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 6 BASIC SETTING 1st speed rpm: 950 Rack travel in mm : 11.40...11.50 Del.guantity cm3/: 11.0...11.2 100 s: (10.7...11.5) Spread cm3 : 0.4100 s: (0.8) 2nd speed rpm : 250.0 Rack travel in mm: 8.4...8.6 Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.2) cm3 : 0.4Spread 100 s: (0.7) GUIDE SLEEVE POSITION Control-lever position Degree: -1 Speed rpm : 600 Rack travel in mm : 13.00...14.00 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 950 Speed : 110.0...112.0 Del.quantity 1000 : (107.0...115.0) : 4.00 Spread cm3 1000 : (8.00) RATED SPEED 1st version Setting point: Speed : 600 rpm Rack travel in mm : 13.5 Testing: 1st rack travel in: 10.40 Speed rpm : 990...1000

Prestroke mm

: 3.20...3.30

x Length mm

2nd rack travel in: 4.00

Speed rpm : 1035...1065 4th rack travel in: 1150

Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm : 8.1

Testing:

rpm : 100 Speed Minimum rack trave: 9.70 rpm : 250 Speed

Rack travel in mm : 8.00...8.20 Rack travel in mm : 2.00

Speed rpm : 330...370

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600 Del.quantity cm3/: 97.0...101.0 1000 s: (94.0...104.0)

Spread cm3 : 6.00 1000 s: (9.00)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 10.40

rpm : 990...1000 Speed

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0)

Remarks:

N10

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MAN 11,1q31 Test sheet Edition : 09.03.87 Replaces Test oil : ISO-4113 Combination no. : 0 402 046 322 Injection pump Pump designation : PES6P110A720LS375 EP type number : 0 412 016 053 Governor : RQ250/1100PA658-17 Governor design. Governer no. : 0 421 801 309 Customer-spec. information Customer : MAN Engine : D2566 MTUH : 195.0 1st version kW : 2200 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 009 assembly **Opening** : 172...175 pressure, bar Test lines : 1 680 750 015 Outside diameter x Wall thickness : 6.00x1.50x600 x Length mm

(A) Injection pump setting values

per values

BEGINNING OF DELIVERY

Prestroke mm

Test pressure, bar: 25...27

Rack travel in mm : 9.00...12.00

Insp. values in parentheses Set equal delivery quant.

> : 3.00...3.10 : (2.95...3.15)

Firing order : 6-2-4-1-5-3 Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 6 BASIC SETTING 1st speed rpm: 1100 Rack travel in mm : 11.70...11.80 Del.quantity cm3/: 14.3...14.5 100 s: (14.0...14.7) Spread cm3 : 0.4100 s: (0.7) 2nd speed rpm : 250.0Rack travel in mm : 6.9...7.1 Del.quantity cm3/: 1.0...1.6 100 s: (0.7...1.8) cm3 : 0.4 Spread 100 s: (0.7) GUIDE SLEEVE POSITION Control-lever position Degree: -2 rpm : 600 Rack travel in mm : 19.20...20.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1100 Aneroiu Del.quantity 1000 Aneroid pressure h: 700 : 143.0...145.0 : (140.5...147.5) : 4.00 Spread cm3 1000 : (7.50)RATED SPEED 1st version Setting point: Speed : 600 rpm Rack travel in mm: 20.0 Testing: 1st rack travel in: 11.70 Speed rpm : 1145...1160 2nd rack travel in: 4.00 rpm : 1185...1215 Speed

4th rack travel in: 1350 Speed rom : 0.00...1.00 LOW IDLE 1 Setting point w/out bumper spring : 250 Speed rpm Rack travel in mm: 7.0 Testing: Speed rpm : 100 Minimum rack trave: 8.50 : 250 Speed rpm Rack travel in mm : 6.90...7.10 Rack travel in mm : 2.00 Speed : 360...400 rpm TORQUE CONTROL Dimension a mm : 0.40 Torque control curve - 1st version 1st speed rpm : 700 Rack travel in m: 12.70...12.90 rpm : 1100 2nd speed Rack travel in m: 11.70...11.80 3rd speed rpm : 810 Rack travel in m: 12.50...12.70 : 950 4th speed rom Rack travel in m: 12.00...12.20 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed man hPa : 700 Pressure Rack travel mm : 12.60...12.70 Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 10.80...10.90 2nd pressure hPa : 200 Rack travel in m: 11.40...11.50 3rd pressure hPa : 310 Rack travel in m: 11.90...12.30 START CUT-OUT Speed 1/min: 170 (190) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 rpm : 700 Speed Del.quantity cm3/: 156.0...160.0 1000 s: (153.0...163.0)

STARTING FUEL DELIVERY

full load rack tr: 11.70

Speed rpm : 100 Del.quantity cm3/ : 225.0...245.0 1000 s: (221.0...249.0)

rpm : 1145...1160

LOW IDLE

Speed

Remarks:

: MAN-NR. 2-7588

**APPLICATION** 

**Omnibus** 

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,4 L13 Edition : 14.04.89 Replaces : 10.85

Test oil : ISO-4113

Combination no. : 0 402 046 324

Injection pump

Pump designation : PES6P110A820LS442

EP type number Governor

: 0 412 016 060

Governor design. : RQ300/1100PA327-9

: 0 421 801 327 Governer no.

Customer-spec. information

Customer : DAIMLER-BENZ

: OM 407 STEHEND Engine

1st version kW : 162.0 : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30 : (3.15...3.35)

Rack travel in mm : 9.00...12.00

Firing order : 6-2-4-1-5-3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.00...11.10

Del.quantity cm3/: 11.3...11.5

100 s: (11.0...11.7)

cm3 : 0.4Spread

100 s: (0.8)

rpm : 300.02nd speed

Rack travel in mm: 8.1...8.3 Del.quantity cm3/: 1.2...1.8

100 s: (0.9...2.0)

Spread cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 600 Speed

Rack travel in mm: 13.00...14.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

: 113.0...115.0 Del.quantity

: (110.5...117.5) 1000 : 4.00 cm3

Spread

1000 : (8.00)

RATED SPEED

1st version

Setting point:

rpm Rack travel in mm: 13.5

Testina:

1st rack travel in: 10.00

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

rpm : 1175...1205 Speed

4th rack travel in: 1300 rpm : 0.00...1.50 Speed

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm : 8.2

Testing:

Speed rpm: 100 Minimum rack trave: 9.50

Speed rpm : 300 Rack travel in mm : 8.10...8.30

Rack travel in mm : 2.00 Speed rpm : 375...415

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600

Del.quantity cm3/: 88.0...92.0 1000 s: (85.0...95.0)

Spread cm3 : 6.001000 s: (9.00)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.00

Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 130.0...150.0 1000 s: (126.0...154.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

Test sheet : RVI 8,8 d 5 Edition : 29.03.89 : 12.12.86 Replaces Test oil : ISO-4113

Combination no. : 0 402 046 328

Injection pump

Pump designation : PES6P120A320RS419-2 : 0 412 026 048 EP type number

Governor

Governor design. : RQ275/950PA753-1 : 0 421 801 377 Governer no.

Customer-spec. information Customer : RVI

Engine : MIDS/PS062045 FC

: 144.0 1st version kW Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27 Prestroke mm : 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 10.00...11.00

BASIC SETTING

1st speed rpm : 500

Rack travel in mm : 8.70...8.80

Del.quantity cm3/: 11.7...11.9

100 s: (11.4...12.2)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 275.0 2nd speed Rack travel in mm: 4.9...5.1 Del.quantity cm3/: 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.8100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2 rpm : 525

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 500 Aneroid pressure h: 700

Del.quantity : 117.0...119.0 1000 : (114.0...122.0)

: 5.00 cm3

Spread : (9.00) 1000

RATED SPEED

1st version

Setting point:

Speed rpm : 525 Rack travel in mm : 20.0

Testing:

1st rack travel in: 7.20

rpm : 1015...1030

2nd rack travel in: 4.00

Speed rpm: 1150...1080 4th rack travel in: 1300

Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 275 Rack travel in mm : 3.5

Testing:

rpm : 200 Speed Minimum rack trave: 5.30 Speed rpm : 275 Rack travel in mm : 3.40...3.60 Rack travel in mm : 2.00

rpm : 300...340 Speed

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

1st speed rpm : 500

Rack travel in m: 8.70...8.80

2nd speed rpm : 950

Rack travel in m: 8.00...8.20

3rd speed rpm : 750

Rack travel in m: 8.30...8.50

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpm hPa : 700 Pressure

Rack travel mm : 8.70...8.80

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 7.90...8.00

2nd pressure hPa : 245

Rack travel in m: 8.50...8.60

START CUT-OUT

Speed 1/min: 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700 Speed rom : 950 Del.quantity cm3/: 136.0...140.0 1000 s: (133.0...143.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 101.0...103.0

1000 s: (98.0...106.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 7.20

Speed rpm : 1015...1030

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0)

LOW IDLE

Speed rpm : 275 Rack travel in mm : 3.40...3.60

Remarks:

Start-of-delivery mark 9.5° cam angle

after start of delivery cyl. 1

APPLICATION

**Omnibus** 

BOSCH INJ. PUMP TEST SPECIFICATIONS : 2.80...2.90 : (2.75...2.95) Prestroke mm Note remarks Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 firing order Test sheet : RVI 8,8 d 6 Edition : 29.03.89 Replaces : 12.12.86 Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 402 046 329 Tolerance + - 0 : 0.50 (0.75) Injection pump BASIC SETTING Pump designation: PES6P120A320RS419-2 EP type number : 0 412 026 048 1st speed rpm : 500 Governor Governor design. : RQ275/950PA843 Rack travel in mm : 8.00...8.10 : 0 421 801 378 Governer no. Del.quantity cm3/: 10.4...10.6 Customer-spec. information Customer : RVI 100 s: (10.1...10.9) Engine : MIDS/PS062045D/A cm3 : 0.5Spread 1st version kW : 129.0 100 s: (0.9) Rated speed : 1900 rpm : 275.0 2nd speed Rack travel in mm : 4.2...4.4 Del.quantity cm3/ : 1.7...2.3 100 s: (1.4...2.6) TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Spread cm3 : 0.8100 s: (1.2) Overflow valve : 1 417 413 025 GUIDE SLEEVE POSITION Control-lever position Inlet press., bar: 1.50 Dearee: -2 Speed rpm : 525 Rack travel in mm : 19.20...20.80 Test nozzle holder assembly : 1 688 901 019 FULL LOAD DELIV. AT FULL LOAD STOP Opening pressure, bar : 207...210 1st version Speed : 500 rpm : 104.0...106.0 Orifice plate Del.quantity 1000 diameter mm : 0,8 : (101.0...109.0) Spread cm3 : 5.00 1000 : (9.00) Test Lines : 1 680 750 067 RATED SPEED Outside diameter x Wall thickness 1st version x Length mm : 6.00x1.50x1000 Setting point:

Speed

Testing:

Speed

Speed

man

rpm : 1015...1030

rpm : 1040...1070

Rack travel in mm: 20.0

1st rack travel in: 7.00

2nd rack travel in: 4.00

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant. per values \_\_\_\_

BEGINNING OF DELIVERY Test pressure, bar: 25...27 4th rack travel in: 1300

rpm : 0.00...1.00Speed

LOW IDLE 1

Setting point w/out bumper spring

rpm : 275° Rack travel in mm: 3.6

Testing:

Speed rpm : 200 Minimum rack trave: 5.20 rpm : 275

Rack travel in mm : 3.50...3.70 Rack travel in mm : 2.00 Speed rpm : 300...340

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

1st speed rpm : 500

Rack travel in m: 8.00...8.10

2nd speed rpm : 950 Rack travel in m: 7.40...7.50

3rd speed rpm : 775

Rack travel in m: 7.60...7.80

START CUT-OUT

1/min: 210 (230) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

rpm : 950 Speed

Del.quantity cm3/: 124.0...128.0

1000 s: (121.0...131.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 7.00

rpm : 1015...1030 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0)

LOW IDLE

Speed rpm : 275 Rack travel in mm : 3.50...3.70

Remarks:

**M18** 

Start-of-delivery mark 9.5° cam angle after start of delivery cyl. 1

**APPLICATION** 

**Omnibus** 

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet

: RVI 9,8 a 7 : 29.03.89

Edition Replaces : 5.8.88

Test oil

: ISO-4113

Combination no. : 0 402 046 330

Injection pump

Pump designation : PES6P120A320RS419-2

EP type number

: 0 412 026 048

Governor

Governor design. : RQ275/1050PA844 Governer no.

: 0 421 801 379

Customer-spec. information Customer

: RVI

Engine

: MIPS062045B

1st version kW

: 176.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines

: 1 680 750 067

Outside diameter

x Wall thickness

x Length mm

: 6.00X1.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasina : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 1050 1st speed

Rack travel in mm : 9.20...9.30

Del.quantity cm3/: 16.0...16.2

100 s: (15.7...16.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0 Rack travel in mm : 3.5...3.7 Del.quantity cm3/: 1.7...2.3

100 s: (1.4...2.6) cm3 : 0.8

Spread 100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050 Speed Aneroid pressure h: 700

: 160.0...162.0 Del.quantity 1000 : (157.0...165.0)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed : 600 rpm Rack travel in mm: 20.0

Testing:

1st rack travel in: 8.20

rpm : 1105...1120

2nd rack travel in: 4.00

Speed rpm: 1170...1200 4th rack travel in: 1300

Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring

rpm : 275 Rack travel in mm: 3.6

Testina:

Speed rpm : 200 Minimum rack trave: 5.50 Speed rpm: 275
Rack travel in mm: 3.50...3.70
Rack travel in mm: 2.00

Speed rpm : 310...350

TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version

1st speed rpm : 1050

Rack travel in m: 9.70...9.80

2nd speed rpm : 700

Rack travel in m: 9.70...9.90

Aneroid/Altitude Compensator Test

1st version

Setting Speed rpm

rpm : 500 hPa : 700 Pressure Rack travel mm : 9.20...9.30

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 8.10...8.30

2nd pressure hPa : 260

Rack travel in m: 8.90...9.00

3rd pressure hPa : 230

Rack travel in m: 8.40...8.60

START CUT-OUT

Speed 1/min: 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm: 700 Det.quantity cm3/: 148.0...154.0 1000 s: (145.0...157.0)

Aneroid pressure h: -

rom : 500 Speed

Del.quantity cm3/: 103.0...105.0

1000 s: (100.0...108.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 8.20

Speed rpm : 1105...1120

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0)

LOW IDLE

Speed rpm : 275 Rack travel in mm : 3.50...3.70

Remarks:

Start-of-delivery mark 9.5° cam angle

after start of delivery cyl. 1

**APPLICATION** 

**Omnibus** 

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet Edition

: MAN 11,9 L : 07.04.89

Replaces Test oil : 26.8.88 : ISO-4113

Combination no.

: 0 402 046 336

Injection pump

Pump designation : PES6P120A720RS517

EP type number

: 0 412 026 054

Governor

Governor design. : RQ750PA895 Governer no.

: 0 421 801 447

Customer-spec. information Customer : MAN

Engine

: D2866TUE

1st version kW

: 190.0

Rated speed

: 1500

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening |

pressure, bar : 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 067

Outside diameter

x Wall thickness

x Length mm

: 6.00X1.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order

: 6- 2- 4- 1- 5- 3

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm: 700

Rack travel in mm : 11.80...11.90

Del.quantity cm3/: 21.0...21.2

100 s: (20.7...21.5)

Spread

cm3 : 0.5

100 s: (0.9)

rpm : 400.0 2nd speed

Rack travel in mm: 4.4...4.6 Del.quantity cm3/: 1.2...1.8

100 s: (0.9...2.1)

cm3 : 0.8Spread

100 s: (1.2)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 210.0...212.0

1000 : (207.0...215.0)

: 5.00 Spread cm3

: (9.00) 1000

RATED SPEED

1st version

Testing:

1st rack travel in: 10.80

rpm : 750...755 Speed

2nd rack travel in: 4.00 rpm : 788...801 Speed

4th rack travel in: 900

Speed : 0.00...1.00 rom

STARTING FUEL DELIVERY

Speed

: 100 rpm

Del.quantity cm3/: 150.0...170.0 1000 s: (146.0...174.0)

:

Remarks:

APPLICATION

Generator

### BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet

: RVI 9,8 g : 29.03.89

Edition

Replaces Test oil

: ISO-4113

Combination no.

: 0 402 046 337

Injection pump

Pump designation : PES6P120A320RS520 EP type number

: 0 412 026 056

Governor

Governor design.

: RQV275...1050PA906

Governer no.

: 0 421 813 724

Customer-spec. information Customer

: RVI

Engine

: MIDRO62045D

### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 1 688 901 019

Opening |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm : (2.75...2.95)

Rack travel in mm : 9.00...12.00

N23

Firing order : 1-5-3-6-2-4

Phasina

: 0-60-120-180-240-300

Tolerance + - 0

: 0.50 (0.75)

BASIC SETTING

1st speed

rpm: 1050

Rack travel in mm : 10.30...10.40

Del.quantity cm3/: 18.8...19.0

100 s: (18.5...19.3)

Spread

cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0 Rack travel in mm: 4.9...5.1

Del.quantity cm3/: 1.7...2.3

Spread

100 s: (1.4...2.6)

cm3 : 0.8100 s: (1.2)

## (B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed

travel mm 1.00...1.20

450 2nd speed rom

: 3.30...3.80 travel mm

: 800 3rd speed rpm

: 5.70...6.00 travel mm

4th speed : 1050 rpm

travel mm : 7.60...7.80

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1130

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Spread

Speed rpm

: 1050

: 188.0...190.0 Del.quantity

1000

: (185.0...193.0)

cm3: 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 61...69

Testina:

1st rack travel in: 9.30

Speed rpm : 1110...1120 2nd rack travel in: 4.00

rom : 1185...1215 Speed

4th rack travel in: 1350

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 6...14

Testing:

Speed rpm : 200 Minimum rack trave: 5.50 Speed rpm : 275

Rack travel in mm : 4.10...4.30

CONSTANT REGULATION

Speed rpm : 275...390

Aneroid/Altitude Compensator Test

1st version

Setting

rpm : 500 hPa : 700 Speed rpm Pressure

Rack travel mm : 10.30...10.40

Measurement

1/min : 500 Speed

1st pressure hPa : -

Rack travel in m: 8.10...8.20

2nd pressure hPa : 360

Rack travel in m: 9.70...9.80

3rd pressure hPa : 160

Rack travel in m: 8.50...8.80

START CUT-OUT

1/min: 195 (215) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

rpm : 650 Speed

Del.quantity cm3/: 171.0...177.0

1000 s: (168.0...180.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 102.0...104.0

1000 s: (99.0...107.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 9.30

Speed rpm : 1110...1120

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0)

LOW IDLE

Speed rpm : 275 Rack travel in mm : 4.10...4.30

Remarks:

Start-of-delivery mark 9.5° cam angle

after start of delivery cyl. 1

### BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

: MB 11,4 i 2 : 29.03.89 : 2.84 Test sheet Edition Replaces

Test oil : ISO-4113

Combination no. : 0 402 046 725

Injection pump

Pump designation : PES6P120A820LS3077-

10

EP type number : 0 412 026 714

Governor

Governor design. : RQ300/1100PA606-2

Governer no. : 0 421 801 249

Customer-spec. information

Customer : DAIMLER-BENZ

Engine : 0M407A

1st version kW : 206.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 019

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10

: (3.95...4.15)

Rack travel in mm : 9.00...12.00 Firing order : 6-2-4-1-5-3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

rpm: 1100 1st speed

Rack travel in mm : 11.00...11.10

Del.quantity cm3/: 16.5...16.7

100 s: (16.2...17.0)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rom : 300.0Rack travel in mm: 5.0...5.2

Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.3) cm3 : 0.8

Spread 100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position Degree: -2

rpm : 650

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100 Aneroid pressure h: 700

Del.quantity : 165.0...167.0

1000 : (-)

Spread cm3 : 5.00

1000 : (-)

RATED SPEED

1st version

Setting point:

Speed : 650 rpm

N25

Rack travel in mm: 20.0 Speed rpm : 600 Del.quantity\_cm3/: 178.5...181.5 Testina: 1000 s: (-) 1st rack travel in: 10.00 Spread cm3 : 8.00rpm : 1145...1160 Speed 1000 s: (-) 2nd rack travel in: 4.00 Aneroid pressure h: rpm : 1190...1220 Speed rpm : 500 Del.quantity cm3/ : 144.0...146.0 Speed 4th rack travel in: 1300 Speed rpm : 0.00...1.501000 s: (-) cm3 : 8.00 Spread LOW IDLE 1 1000 s: (-) Setting point w/out bumper spring rpm : 300 Rack travel in mm: 5.1 BREAKAWAY Testing: 1st version Speed : 100 COM 1mm rack travel less than Minimum rack trave: 6.50 : 300 Speed COM full load rack tr: 10.00 Rack travel in mm : 5.00...5.20 Rack travel in mm : 2.00 Speed rpm : 380...420 Speed rpm : 1145...1160 STARTING FUEL DELIVERY TORQUE CONTROL Dimension a mm :? Speed rpm : 100 Del.quantity cm3/: 150.0...170.0 1000 s: (-) Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 11.00...11.10 2nd speed : 950 rpm Remarks: Rack travel in m: 11.25...11.45 3rd speed rpm : 850 Rack travel in m: 11.75...11.95 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed **MC1** Pressure hPa : -Rack travel mm : 10.40...10.60 Measurement 1/min: 500 Speed 1st pressure hPa : 280 Rack travel in m: 10.80...10.90 2nd pressure hPa : 350 Rack travel in m: 11.40...11.60 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700

N26

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 4.30...4.40 : (4.25...4.45) Rack travel in mm : 9.00...12.00 Firing order : 6-2-4-1-5-3 Note remarks : MB 11,7 a 1 : 14.04.89 Test sheet Edition Replaces : 9.3.87 Test oil : ISO-4113 Phasina : 0-60-120-180-240-300 Combination no. : 0 402 046 751 Tolerance + - 0 : 0.50 (0.75) Injection pump Time to cyl. no. : 6 Pump designation : PES6P110A820LS3131 : 0 412 016 715 EP type number BASIC SETTING Governor Governor design. : RQ300/1100PA723 1st speed rpm: 1100 Governer no. : 0 421 801 265 Rack travel in mm : 11.10...11.20 Customer spec. information Customer : DAIMLER-BENZ Del.quantity cm3/: 14.0...14.2 : 0M427H Engine 100 s: (13.7...14.5) 1st version kW : 177.0 cm3 : 0.4Spread Rated speed : 2200 100 s: (0.8) TEST BENCH REQUIREMENTS 2nd speed rpm : 300.0 Rack travel in mm : 7.1...7.3 Test oil inlet temp. °C Del.quantity cm3/: 1.4...2.0 : 38...42 100 s: (1.1...2.3) Overflow valve Spread cm3 : 0.4: 1 417 413 025 100 s: (0.7) Inlet press., bar: 1.50 GUIDE SLEEVE POSITION Control-lever position Overflow Degree: -2 quantity min. 1/h: 100...120 rpm : 550 Speed Rack travel in mm: 14.70...16.40 Test nozzle holder : 0 681 343 009 assembly FULL LOAD DELIV. AT FULL LOAD STOP Opening 1st version pressure, bar : 172...175 Speed rpm : 1100 Del.quantity : 140.0...142.0 1000 : (137.0...145.0) Test lines : 1 680 750 015 Spread : 4.00 cm3 1000 : (8.00) Outside diameter x Wall thickness RATED SPEED x Length mm : 6.00x1.50x600 1st version

Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

(A) Injection pump setting values Insp. values in parentheses

Testing:

Speed

Setting point:

1st rack travel in: 10.20

rpm Rack travel in mm: 15.5

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

Speed rpm: 1175...1205 4th rack travel in: 1300

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm : 7.2

Testing:

Speed rpm : 100 Minimum rack trave: 8.80

Speed rpm : 300 Rack travel in mm : 7.10...7.30

Rack travel in mm : 2.00

: 360...400 Speed rpm

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600 Del.quantity cm3/ : 117.0...121.0 1000 s: (114.0...124.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.20

Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 130.0...150.0 1000 s: (126.0...154.0)

Remarks: